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Report No. 12

June 18, 1984

AD-A145 954

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**An Archeological Overview and
Management Plan for the
Mississippi Army Ammunition Plant,
Hancock County, Mississippi**

Under Contract CX-5000-3-0771
with the

**National Park Service
U.S. Department of the Interior**
Washington DC 20240

for the
U.S. Army Materiel Development and
Readiness Command

by

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84 09 18 027

REPORT DOCUMENTATION PAGE		1. REPORT NO.	2.	3. Recipient's Accession No.						
4. Title and Subtitle An Archeological Overview and Management Plan for the Mississippi Army Ammunition Plant, Hancock County, Mississippi				5. Report Date June 18, 1984						
7. Author(s) Gerald P. Smith				6. Performing Organization Rept. No. DARCOM report #12						
9. Performing Organization Name and Address Woodward-Clyde Consultants subcontractor: One Walnut Creek Center Memphis State University 100 Pringle Avenue Memphis, TN 38152 Walnut Creek, CA 94596				10. Project/Task/Work Unit No. 60903A/0001-1						
12. Sponsoring Organization Name and Address U. S. Department of the Interior National Park Service Russell Federal Building, 75 Spring Street S.W. Atlanta, GA 30303				11. Contract(G) or Grant(G) No. (C) CX-5000-3-0771 (G)						
13. Type of Report & Period Covered FINAL				14.						
15. Supplementary Notes This report was prepared as part of the DARCOM Historical/Archeological Survey (DHAS), an inter-agency technical services program to develop facility-specific archeological overviews and management plans for the U. S. Army Materiel Development and Readiness Command (DARCOM).										
16. Abstract (Limit: 200 words) The Mississippi Army Ammunition Plant (AAP) is the first ammunition plant to have been built by the U. S. Army in more than 25 years. The facility is located on the northern portion of NASA's National Space Technology Laboratory (NSTL) facility near Bay St. Louis, Hancock County, Mississippi. The 7,148-acre plant manufactures projectiles. Construction began in 1979 and will continue until 1984. A brief reconnaissance survey of cultural resources was conducted in 1974; however, no archeological sites were found or recorded. Information exists for the plant vicinity, however, which indicates that both prehistoric and historic sites occur in the area, and could also occur on the facility property. Prehistoric sites spanning the entire period of human occupation of the area are known, and an important contact-period Indian village is suggested to be in the immediate vicinity. Management recommendations include a staged archival and archeological study in order to develop a data base for use in historic preservation planning. The base cost of this recommended Phase I program is anticipated to cost between \$72,200 and \$85,560 in FY84 dollars. This proposed program represents an ideal model for cultural resource management at the Mississippi AAP.										
17. Document Analysis <table border="0" style="width: 100%;"> <tr> <td style="vertical-align: top;"> a. Descriptors Archeological Management Army Installation Management Environmental Assessment </td> <td style="vertical-align: top;"> reference: Thesaurus of Engineering and Scientific Terms </td> </tr> <tr> <td colspan="2"> b. Identifiers/Open-Ended Terms Cultural Resource Management Mississippi History Mississippi Prehistory Mississippi Paleoenvironments </td> </tr> <tr> <td colspan="2"> c. COSATI Field/Group 5f </td> </tr> </table>					a. Descriptors Archeological Management Army Installation Management Environmental Assessment	reference: Thesaurus of Engineering and Scientific Terms	b. Identifiers/Open-Ended Terms Cultural Resource Management Mississippi History Mississippi Prehistory Mississippi Paleoenvironments		c. COSATI Field/Group 5f	
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18. Availability Statement: Available for public release		19. Security Class (This Report) Unclassified	21. No. of Pages xi + 51							
		20. Security Class (This Page) Unclassified	22. Price							

MANAGEMENT SUMMARY

The Mississippi Army Ammunition Plant (AAP) is the first ammunition plant to have been built by the U. S. Army in more than 25 years. The facility is located on the northern portion of NASA's National Space Technology Laboratory (NSTL) facility near Bay St. Louis, Mississippi. The 7,148-acre plant employs the most modern advances in manufacturing methods and technology in its manufacture of projectiles. Construction of the facility began in 1979 and will continue until 1984.

A brief cultural resources reconnaissance of the pre-facility area was conducted in 1974, but there are no apparent surviving records. Present information indicates that no archeological sites were identified or recorded. Sufficient archeological and historic data exist for the plant vicinity, however, to indicate that prehistoric and/or historic archeological remains could occur on the property. Recorded prehistoric sites in the facility area include sites representing the entire span of human occupation of the area, while historic data suggest that an important contact-period Indian village is within the immediate vicinity.

Management recommendations include a staged archival and archeological study in order to develop a data base for use in historic preservation planning. The base cost of the recommended Phase I program is anticipated to cost between \$72,200 and \$85,560 in FY84 dollars.



PREPARERS AND QUALIFICATIONS

Gerald P. Smith is the Principal Investigator and author of this report. He holds a BA with Honors in Anthropology, an MA in Anthropology (University of North Carolina-Chapel Hill), and a PhD in Anthropology (University of Missouri-Columbia), all with emphasis in archeology and graduate minors in physical and historical geography. He is an adjunct Associate Professor of Anthropology at Memphis State University and has been curator of that Department's Chucalissa facility since 1968. His 20 years of experience in southeastern archeology has included excavation and survey work in Alabama, Arkansas, Kentucky, Mississippi, Missouri, North Carolina, Tennessee, and Virginia, with emphasis on cultural resource management projects during the past ten years.

ACKNOWLEDGEMENTS

Mr. Raymond Leibelsperger (Chief of Operations and Review) and Don Bales (Forester) at the Mississippi Army Ammunition Plant were most cordial in the arrangements for Dr. Gerald Smith's visit to the facility. Mr. Bales was an enthusiastic and knowledgeable guide over the facility, assisting in the review of the various activity areas and potential archeological resource areas. He also provided useful insight into some of the local botanical resources and forest management methods, which differ somewhat from those Dr. Smith had previously encountered in coastal Virginia and North Carolina. Dr. Harold Balbach, U. S. Army Corps of Engineers, Champaign, Illinois, provided information on some previous brief reconnaissance survey work conducted on the Mississippi AAP.

Additional thanks go to Dr. Mark E. Barnes and Ms. Susan Garrett, NPS, SERO; Ms. Mary Lee Jefferson, NPS, WASO; Mr. Elbert Hilliard, Mississippi SHPO, and his staff, who reviewed the draft Mississippi document; and Ms. Susan Cleveland, Contracting Officer, NPS, SERO.

Final report preparation, including graphics, has been completed by Woodward-Clyde Consultants, with editorial review (particularly of management recommendations) and text preparation completed by Dr. Ruthann Knudson, Ms. Betty Schmucker, and Mr. Charles McNutt, Jr.

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FOREWORD

As a federal agency with large public land holdings, the U. S. Army is responsible for the stewardship of a variety of natural and cultural resources that are part of its installations' landscapes. The Army's Materiel Development and Readiness Command (DARCOM) presently manages a nationwide network of 65 installations and 101 subinstallations and separate units, which range in size from one acre to over one million acres. As part of its programs of environmental and property management, DARCOM has requested that the U. S. Department of the Interior's National Park Service provide technical guidance to develop programs for managing installation cultural resources.

NPS is thus conducting the DARCOM Historical/Archeological Survey (DHAS), which has two major disciplinary elements. The architectural review and planning function is being directed by the Service's Historic American Buildings Survey (HABS), while the prehistoric and historic archeological resource assessment and planning function is the responsibility of the Service's Interagency Resource Division (IRD). IRD has contracted with Woodward-Clyde Consultants (WCC) for the development of guidelines for the DARCOM archeological management planning effort, and for the completion of 41 overviews and plans throughout the central United States. WCC has in turn subcontracted the technical studies to several regional subcontractors, with final editorial review of reports and preparation of text and illustrations handled by WCC.

This overview and recommended management plan for the archeological resources of the Mississippi Army Ammunition Plant was prepared by Memphis State University, Memphis, under subcontract to WCC. It follows the guidance of "A Work Plan for the Development of Archeological Overviews and Management Plans for Selected U. S. Department of the Army DARCOM Facilities," prepared by Ruthann Knudson, David J. Fee, and Steven E. James as Report No. 1 under the WCC DARCOM contract. A complete list of DHAS project reports is available from the National Park Service, Washington, DC.

The DHAS program marks a significant threshold in American cultural resource management. It provides guidance that is nationally applicable, is appropriately directed to meeting DARCOM resource management needs within the context of the Army's military mission, and is developed in complement to state and regional preservation protection planning (the RP3 process, through State Historic Preservation Offices). All of us participating in this effort, particularly in the development of this report, are

pleased to have had this opportunity. Woodward-Clyde Consultants appreciates the technical and contractual guidance provided by the National Park Service in this effort, from the Atlanta and Washington DC offices and also from other specialists in NPS regional offices in Philadelphia, Denver, and San Francisco.

Woodward-Clyde Consultants

Ruthann Knudson

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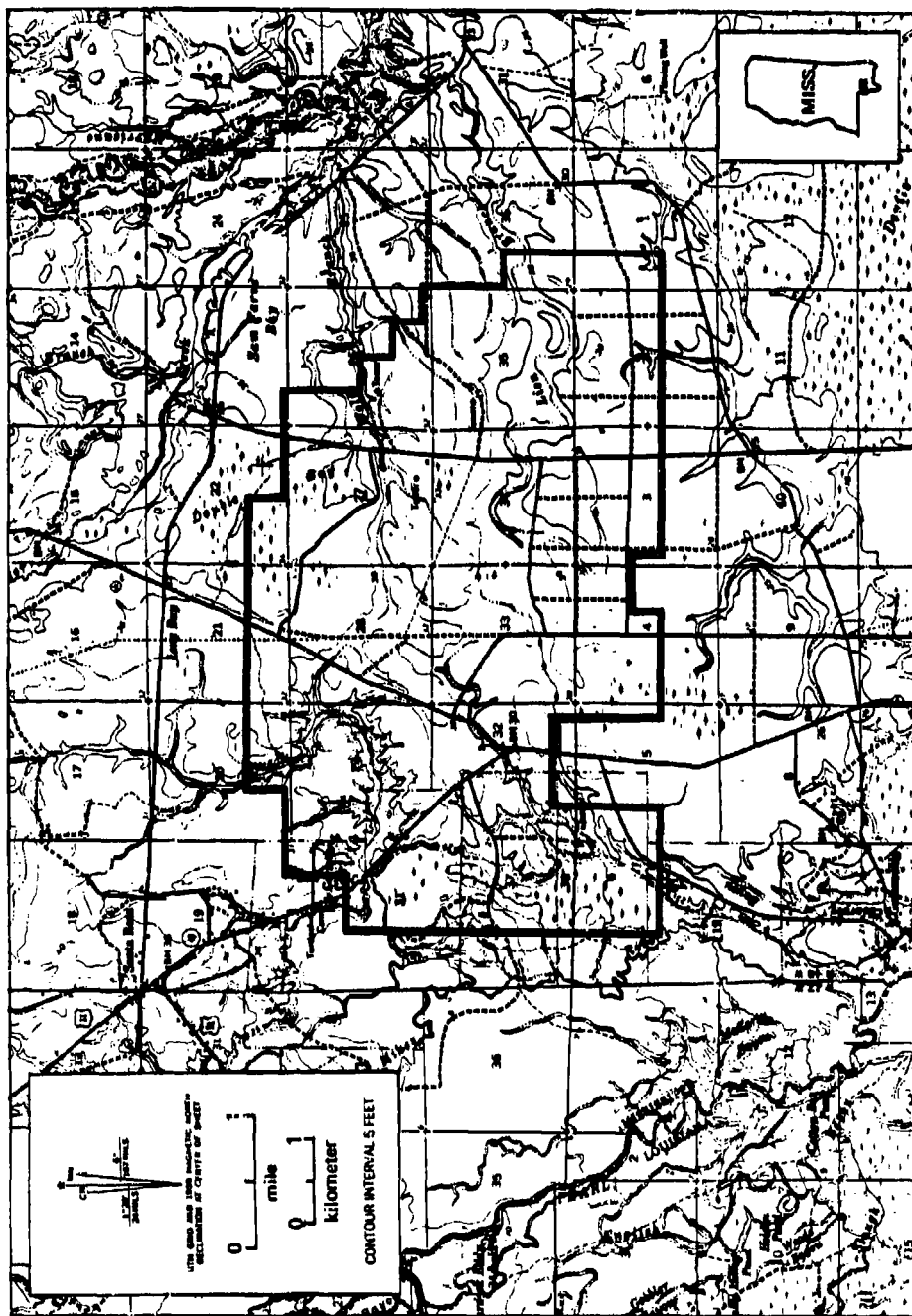
INTRODUCTION

The following report is an overview of and recommended management plan for the prehistoric and historic archeological resources that are presently known or likely to occur on the Mississippi Army Ammunition Plant in Hancock County, Mississippi (Figure 1-1). This facility is an installation of the U. S. Department of the Army DARCOM (Materiel Development and Readiness Command), which as a reservation of public land has responsibilities for the stewardship of the cultural resources that are located on it. The following is that portion of the facility-specific survey that is focused on the prehistoric and historic resource base of the Mississippi Army Ammunition Plant (AAP), and was developed in accordance with the Level B requirements as set forth in the archeological project Work Plan (Knudson, Fee, and James 1983). A companion historic architectural study is in preparation by the National Park Service's Historic American Building Survey (HABS), but is not yet available (William Brenner, personal communication 1984).

1.1 PURPOSE AND NEED

A corpus of federal laws and regulations mandate cultural resources management on DARCOM facilities. Briefly these are:

- The National Historic Preservation Act of 1966 as amended (80 Stat. 915, 94 Stat. 2987; 16 USC 470), with requirements to,
 - inventory, evaluate, and where appropriate nominate to the National Register of Historic Places all archeological properties under agency ownership or control (Sec. 110(a)(2))
 - prior to the approval of any ground-disturbing undertaking, take into account the project's effect on any National Register-listed or eligible property; afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on the proposed project (Sec. 106)
 - complete an appropriate data recovery program on an eligible or listed National Register archeological site prior to its being heavily damaged or destroyed (Sec. 110(b), as reported by the House Committee on Interior and Insular Affairs [96th Congress, 2nd Session, House Report No. 96-1457, p. 36-37])



Note: Base map is the USGS Nicholson, Miss.—LA. 7.5 min. (1959) sheet.

Figure 1-1. MAP OF THE GENERAL VICINITY OF THE MISSISSIPPI AAP

- Executive Order 11593 (36 FR 8921), whose requirements for inventory, evaluation, and nomination, and for the recovery of property information before site demolition, are codified in the 1980 amended National Historic Preservation Act.
- The Archeological and Historic Preservation Act of 1974 (88 Stat. 174, 16 USC 469), which requires that notice of an agency project that will destroy a significant archeological site be provided to the Secretary of the Interior; either the Secretary or the notifying agency may support survey or data recovery programs to preserve the resource's information values
- The Archeological Resources Protection Act of 1979 (93 Stat. 721, 16 USC 470aa; this supersedes the Antiquities Act of 1906 [93 Stat. 225, 16 USC 432-431]), with provisions that effectively mean that
 - The Secretary of the Army may issue excavation permits for archeological resources on DARCOM lands (Sec. 4)
 - No one can damage an archeological resource on DARCOM lands without a permit, or suffer criminal (Sec. 6) or civil penalties (Sec. 7)
- 36 CFR 800, "Protection of Historic and Cultural Properties" (44 FR 6068, as amended in May 1982); these regulations from the Advisory Council on Historic Preservation set forth procedures for compliance with Section 106 of the National Historic Preservation Act
- Department of the Interior procedures for determining site eligibility for the National Register of Historic Places (36 CFR 60, 36 CFR 63), and standards for data recovery (proposed 36 CFR 66)
- United States Department of the Army procedures and standards for the preserving historic properties (32 CFR 650.181-650.193; Technical Manual 5-801-1; Technical Note 78-17; Army Regulation 420); and procedures for implementing the Archaeological Resources Protection Act (32 CFR 229).

Integration of the necessary procedures into basic facility operations and planning is needed to assure effective management of the various archeological resources on the property and minimize the risk of unanticipated project disruptions. This operational integration should include assuring awareness of the locations and need for preservation of the resources on the part of maintenance personnel as well as the engineering and planning staff in order to preclude damage from maintenance and groundskeeping activities. Over a period of time a tree planted here, a drain line or sidewalk run there, and a bucket of "X" dumped

somewhere else can destroy a site as effectively as a bulldozer and is a long-term hazard which may best be prevented by routine facility-level procedures.

1.2 THE MISSISSIPPI ARMY AMMUNITION PLANT

The Mississippi Army Ammunition Plant (AAP) is the first ammunition plant to have been built by the U. S. Army in more than 25 years. The new plant is located on the northern portion of NASA's National Space Technology Laboratories (NSTL) facility near Bay St. Louis, Mississippi, and consists of three separate manufacturing complexes: the projectile metal parts area; the cargo metal parts area; the load, assemble, and pack area; plus support and administrative facilities (Figure 1-2). The plant employs the most modern advances in manufacturing methods and technology to integrate fully in one location all steps of projectile manufacture. The 7,148-acre plant is designed to be capable of producing the 155mm M483A1 artillery projectile. This will contribute significantly to the army's capability to meet mobilization requirements for this new type of artillery shell.

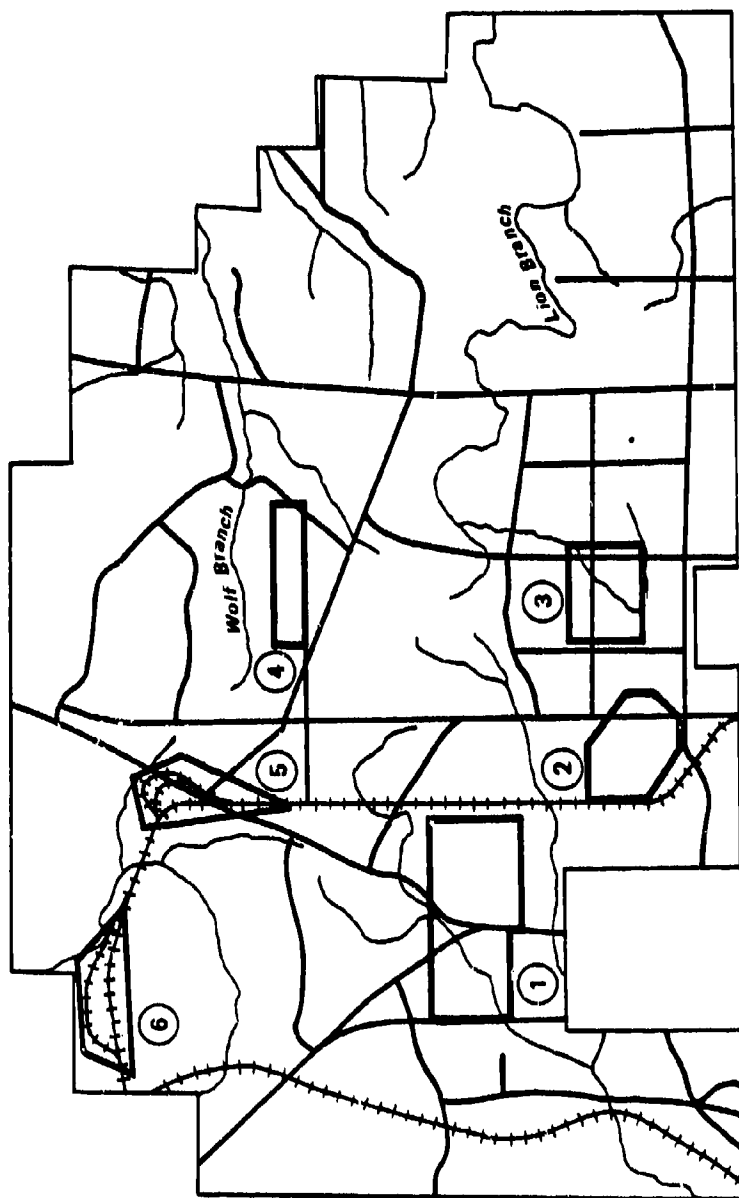
Construction and equipping of this important new facility, which began in early 1979, will continue until 1984. Overall development and management of the project is the responsibility of the Army's Project Manager for Munitions Production Base Modernization and Expansion. The Army Corps of Engineers is responsible for plant construction, which is being accomplished under contracts by commercial construction firms. This is a government-owned/contractor-operated (GOCO) facility operated by Mason Chamberlain Incorporated, integrating construction and equipment purchase and installation activities to provide efficient, smooth running production lines.

To date, construction activities under the supervision of the U. S. Army Corps of Engineers include the following:

- First increment of site development: clearing and grubbing, ditching and drainage for the metal parts manufacturing area
- Second increment of site development: sanitary sewage, potable water, roadway layout and paving, railroads in metal parts manufacturing area, and 13.8kv power distribution from NSTL substation to MPTS area

1.3 SUMMARY OF PREVIOUS ARCHEOLOGICAL WORK

A selective cultural resources reconnaissance survey was conducted at the Mississippi AAP in 1974. This was described as "minimal" survey, as the surveyors apparently only looked in the "most likely spots" of apparently unspecified portions of the then pre-facility property area. No archeological sites or isolated finds were recorded; only recent historic trash was found on what is now facility property. U. S. Army



LEGEND



0 1
mile

0 1
kilometer

- ① Construction of Headquarters and Main Assembly Complex
- ② Construction of Production Line
- ③ Test Area
- ④ Igloo Storage
- ⑤ Railroad Loading Area
- ⑥ Railroad Loading Area

Figure 1-2. MASTER BASE MAP OF THE MISSISSIPPI AAP

Corps of Engineers personnel have apparently discarded records from that period, and have no copy of any report that may have been written (Harold Balbach, personal communication 1984). Further, there are no surviving records of any field reconnaissance in the Mississippi Department of Archives and History Archaeological Survey files.

1.4 THE SOCIOCULTURAL CONTEXT OF ARCHEOLOGICAL RESOURCES IN THE VICINITY OF THE MISSISSIPPI ARMY AMMUNITION PLANT

Local archeological resources can be expected to have quite different significance to various groups and individuals in the area, or even far beyond the area. Archeologists are concerned with archeological resources in terms of the scientific information they can provide about human ways of life as they have developed through time. This concern includes topics ranging from the technology of particular tools to integration of local data into large-scale patterns of human activity.

Historians share many concerns of the archeologist but confine themselves to the relatively short, recent period of written records. Their interests generally emphasize the use of archeological data to confirm and/or expand the written record of the area. Within this context the French were the earliest settlers of the region and their descendants maintain a continuing interest in the history and customs of those settlers.

Geologists and engineers have come to take a strong interest in the archeology of the Pearl River area and the adjacent areas because of the close association of archeological sites with key geological features. Detailed chronologies and local environmental data recovered by the archeologists are crucial information for geologists and engineers seeking to understand and deal with processes affecting the behavior of the river today.

The first known historic inhabitants of the area, the Acolapissa and Tangipahoa Indian tribes, no longer exist. Choctaws from central Mississippi have been moving into the area since the early nineteenth century and are also frequent temporary residents while working in the area oil fields and shipyards (Grady John, personal communication 1984). There are also many Indian groups in the nation and region who take an interest in archeological resources and whose members are often quite mobile. The interests of these groups span the entire range of concern for such resources, from representing the surviving evidence of their cultural heritage to use of the resources as vehicles for social and political activities. Any actual or potential disturbance or destruction of Indian burials is a particularly sensitive issue. It must be handled with great care whenever raised, regardless of any apparent relationship or lack of relationship between the particular living and dead individuals involved.

AN OVERVIEW OF THE CULTURAL AND RELEVANT
NATURAL HISTORY OF THE MISSISSIPPI AAP

2.1 THE PHYSICAL ENVIRONMENT

2.1.1 Earth Resources

The Mississippi Army Ammunition Plant is located on a Coastal Plain marine terrace overlooking the floodplain of the Pearl River. Soils of this terrace consist primarily of Atmore Silt Loam, Harleston Fine Sandy Loam, Escambia Loam, and Smithton Fine Sandy Loam (Smith et al. 1981). These are strongly acid soils that are often wet or flooded except for the Harleston soil, which is moderately well drained. The soils of the Pearl River floodplain are the frequently flooded Arkabutla-Rosebloom and Handsboro soil associations. A few small areas of Poarch Fine Sandy Loam, a strongly acid but well drained soil, occur along the edge of the Pearl River floodplain. The general warm climate and high rainfall of the area are specifically noted by Smith et al. (1981:59) as causing severe leaching of nutrients from the soils of the area. The Poarch, Harleston, and Escambia soils are all considered capable (under modern intensive management) of corn yields on the order of 90 bushels per acre, and Atmore can produce about 40 bushels per acre. Their productivity under pre-industrial, no-fertilizer conditions would have been severely limited in both quantity and temporal duration.

Local lithic resources are gravels from the Pearl River floodplain, consisting primarily of small chert cobbles derived from inland deposits.

2.1.2 Water Resources

The water resources of the AAP consist of a network of swampy streams on the marine terrace surface, and the various channels of the Pearl River through its floodplain on the western edge.

2.1.3 Modern Climate

The modern climate can be summarized as humid, with short mild winters and long hot summers. Recent data from Bay St. Louis indicate a growing season of over 280 days during eight out of ten years (Smith et al. 1981:71). Minimum temperatures below freezing can be expected regularly by early December and continue to occur as late as early March during 2 out of 10 years. Maximum temperatures above 90° F. (32° C) continue regularly from early May through late September. Rainfall averages

slightly under 57 inches per year, with 3.9 or more inches per month expectable every month except October and November, which average 2.42 and 3.35 inches respectively. The maximum average is 6.38 inches during September, which is also the peak of the hurricane season. Hurricanes pass through or near the area every few years and can produce severe damage by various combinations of high winds, high tides, heavy rainfall, and spin-off tornadoes.

2.1.4 Plant Resources

The terrace surface is covered by a mixed pine forest composed primarily of longleaf, shortleaf, and loblolly pines mixed with a wide variety of hardwoods, shrubs, and palmetto in the areas of greater moisture. Areas with better drained, sandy soils are generally covered with the longleaf pine and wiregrass, while the moist soils of stream valleys and silt loam flatwoods include a complex mixture of loblolly and shortleaf pines, magnolia, beech, holly, oaks, hickories, gums, and walnut.

Several researchers, notably Quarterman and Keever (1962) and Delcourt and Delcourt (1977), have emphasized the role of fire in maintaining the pine forest. They note the strong tendency of hardwoods to replace pines on moist soils throughout the southeastern coastal plain north of the Florida peninsula when fire control is introduced and maintained. The Pearl River floodplain was essentially a gum-cypress swamp until the cypress trees were removed by logging operations during the late nineteenth and early twentieth centuries.

Pecan, shagbark hickory, and walnut would have provided the prime sources of nuts since they do not require leaching of excess tannic acid before they are eaten by humans. Their occurrence is scattered along the margins of areas of moist soils and they are minor species in the total forest composition. Other important vegetal resources include grape, persimmon, blackberries, greenbrier (root), and cattail (root) as sources of food, and cambe as a key industrial plant for use in matting, basketry, blowguns, arrow shafts, and knives.

2.1.5 Animal Resources

Animals of particular importance in the Coastal Plain terrace zone would include deer, bear, rabbit, and turkey. These species would also be present in far lesser numbers and/or seasonally in the floodplain, where beaver, muskrat, raccoon, alligator, mink, and otter were the more plentiful resident game. Fresh water species such as drum, buffalo, catfish, crawfish, and clams would also have been obtainable from the floodplain. Only a few miles away by canoe are the Pearl River estuary, the Gulf of Mexico, and Lake Pontchartrain with their wide variety of fish, ducks, and marshland resources.

2.1.6 Paleoenvironment

The past environments of the Plant area have been subject to drastic changes during the past 12,000 years, the period of best documented human presence in the New World (Table 2-1). Primary factors involved have

Table 2-1. A SUMMARY OF THE ENVIRONMENTAL HISTORY OF THE AREA OF THE MISSISSIPPI AAP^a

Date	Inferred Climate	Primary Forest Composition
Present to	Temperatures and rainfall approximate modern conditions	Pine forest on marine terraces, gum-cypress forest in major stream bottoms, mixed hardwoods on stream margins
2000 BC to	Temperatures above modern conditions and rainfall below or near modern conditions	Oak-pine forest on terraces with magnolia increasing, hickory and sweetgum decreasing rapidly; mixed hardwoods and gum-cypress swamp in same habitats as modern
8000 BC	Temperatures at or slightly below modern conditions; rainfall somewhat above modern conditions	Oak-hickory-pine forest on terraces with sweetgum a major secondary species; mixed hardwoods and gum-cypress swamp in same habitats as modern

^a Data based on Delcourt 1980.

been changes in sea level, major east-west changes in the location of the mouth of the Mississippi River, and climatic changes. Up to about 8000 BC the coastline may have initially been up to 50 miles south of its present position, with sea level as much as 120 feet below its present level and the mouth of the Mississippi southeast of New Orleans (Figure 2-1). Under these conditions the Pearl River would initially have been deeply entrenched, but would have undergone progressive filling of its valley as sea level rose to about 60 feet below present levels by the end of the period. Pollen studies undertaken just northeast of Mobile, Alabama, in a similar geographic setting (Delcourt 1980) suggest somewhat higher rainfall and a forest cover composed of mixed oak-hickory-pine forest with sweetgum as a major secondary species. Such a forest should have had a far higher carrying capacity than the modern forest for such species as deer, bear, turkey, and squirrel due to the much greater abundance of nuts. Swamp and coastal plant and animal species would have been far less locally important due to lack of habitat.

Between about 8000 and 3000 BC the primary changes appear to have been a reduction in the hickory and sweetgum importance in the local forest and formation of offshore barrier islands through the present location of New Orleans eastward to about Waveland (Figure 2-2). Rapid changes between about 3000 and 2000 BC saw a rise in sea level to about the present level, formation of a new, eastward-growing Mississippi River delta, and replacement of the oak-hickory-pine forest by essentially modern forest composition (Figure 2-3). The rapid sea level rise would have converted the Pearl River valley into an estuary similar to Mobile Bay perhaps as far upstream as the Plant property, and would have begun the conversion of an embayment of the Gulf of Mexico into the present Lake Pontchartrain. Changes since about 2000 BC have consisted largely of siltation of the postulated Pearl River estuary, formation of the modern Mississippi River delta area southeast of New Orleans, and reclamation by the Gulf of Mexico of much of the area east and west of that delta that had once been filled by the earlier delta formations (Figures 2-4, 2-5, 2-6).

2.2 CULTURAL ENVIRONMENT

2.2.1 Prehistory

The southeastern United States has had a human occupation for at least the past 12,000 years and perhaps longer (Table 2-2). The earliest well documented occupations are those of the Paleo-Indian culture. Fluted and unfluted Clovis points have been found in the area on the Prairie and Deweyville terraces, the lowest and most recent of the coastal plain terraces. Such points are normally associated with stone knives, scrapers, drills, and bone-working tools. The area at that time would have been in oak-hickory-pine forest on the uplands and probably a gum-cypress swamp in the Pearl River valley. The Gulf of Mexico would have been several miles further away than at present and an open coastline would have extended almost due east and west to the Mississippi River, then in a north-south channel well to the west of present day New Orleans (Figure 2-1).

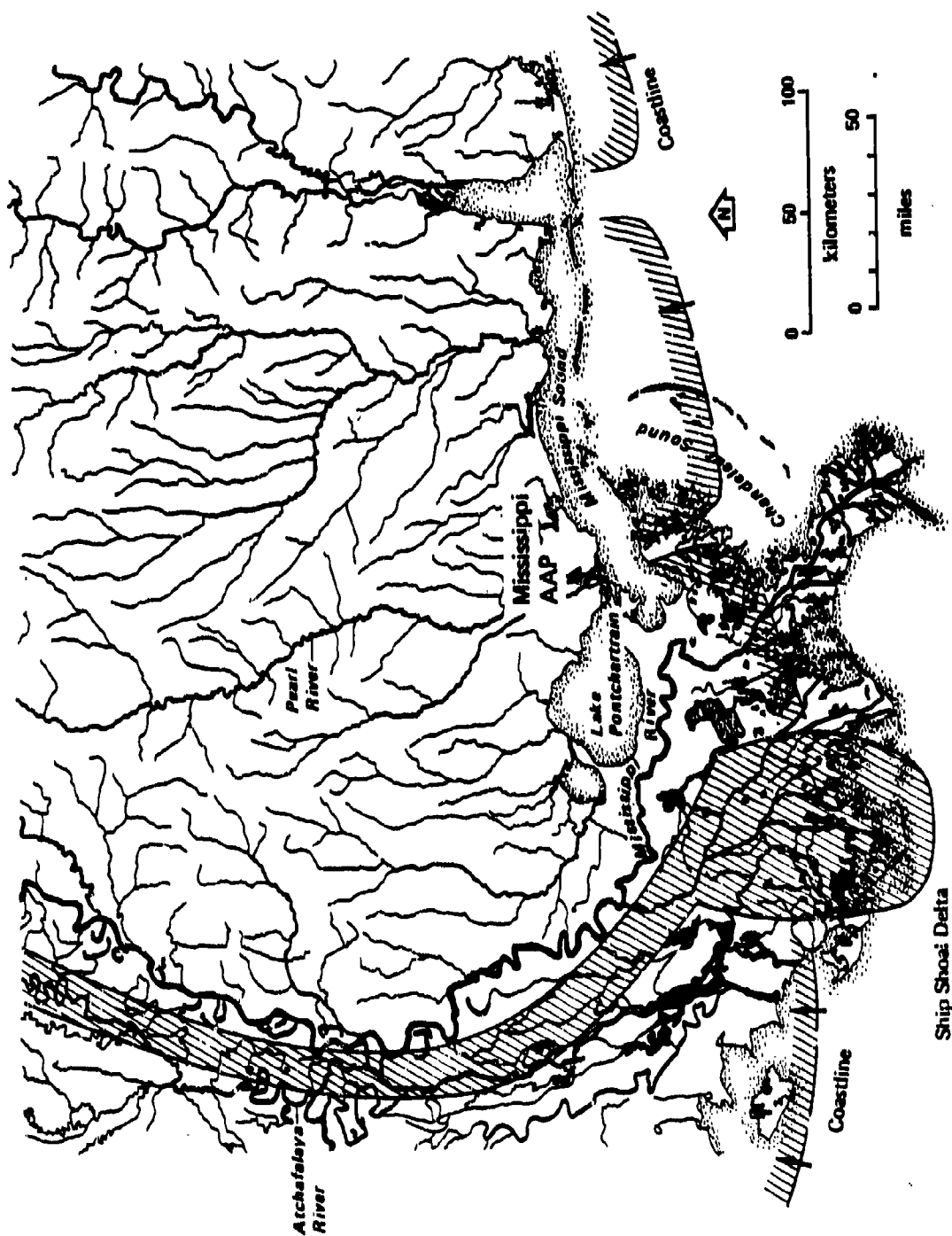


Figure 2-1. APPROXIMATE LOCATION OF MAJOR GEOGRAPHIC FEATURES DURING THE PALEO-INDIAN PERIOD (sea level: -30 m at 8000 BC, -60m at 12,000 BC; data from Gagliano et al. 1982; Saucier 1963 and 1974)

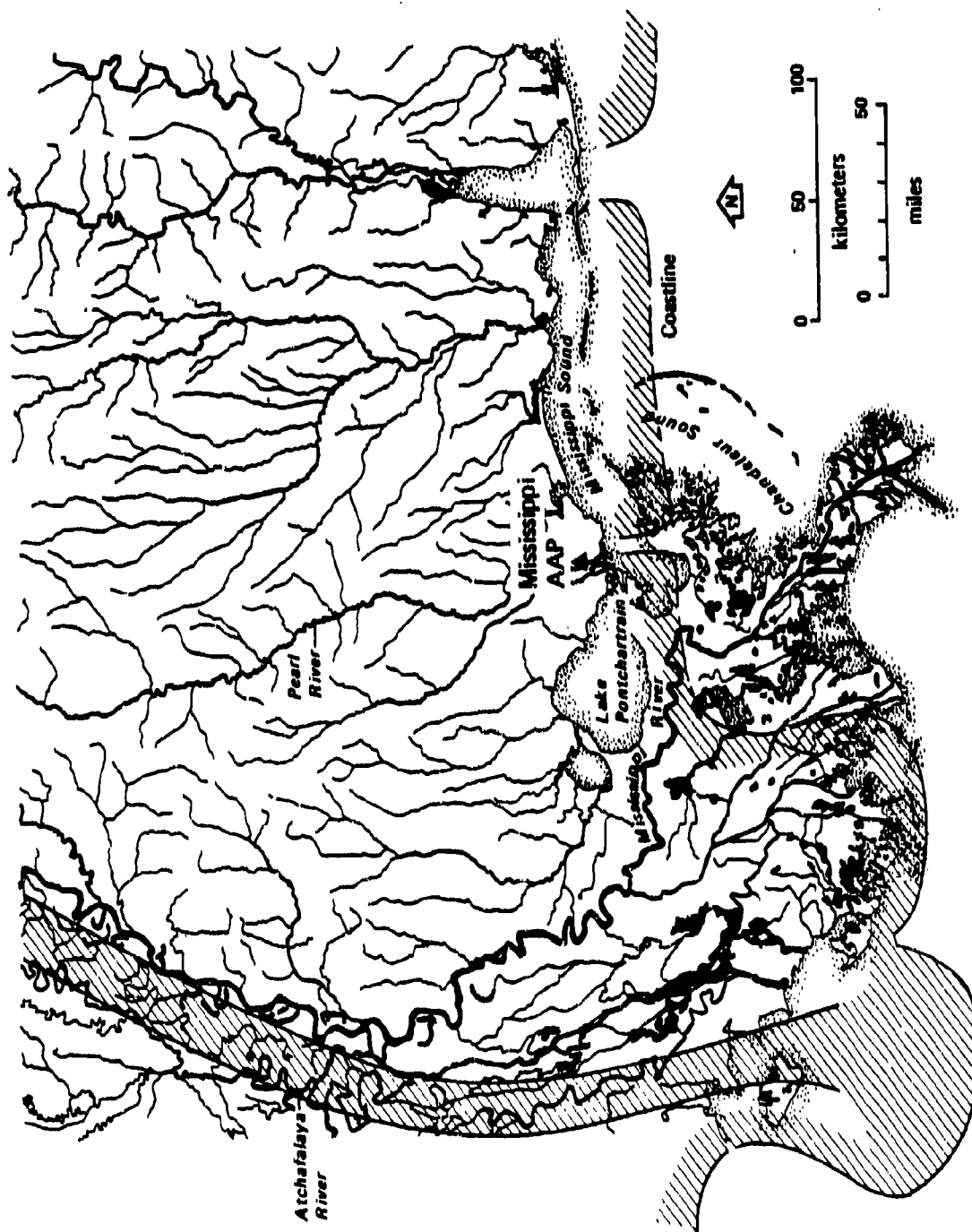


Figure 2-2. APPROXIMATE LOCATION OF MAJOR GEOGRAPHIC FEATURES DURING THE EARLY AND MIDDLE ARCHAIC PERIODS, ABOUT 8000-4000 BC (sea level: about -20m; data from Gagliano et al. 1982; Saucier 1963 and 1974)

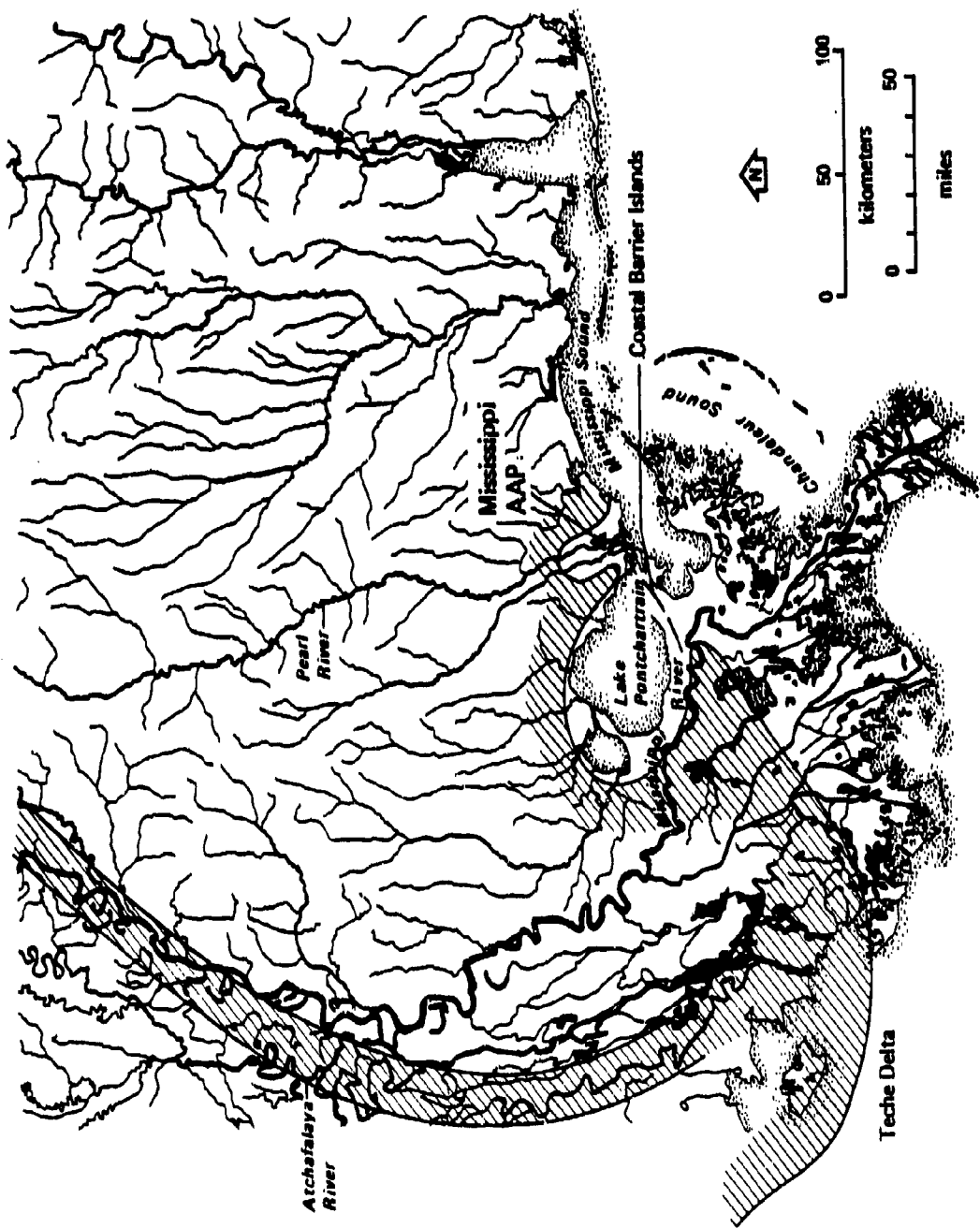


Figure 2-3. APPROXIMATE LOCATION OF MAJOR GEOGRAPHIC FEATURES DURING THE MIDDLE AND LATE ARCHAIC PERIODS, ABOUT 4000-2000 BC (sea level to 0 by about 2000 BC; data from Gagliano et al. 1982; Saucier 1963 and 1974)

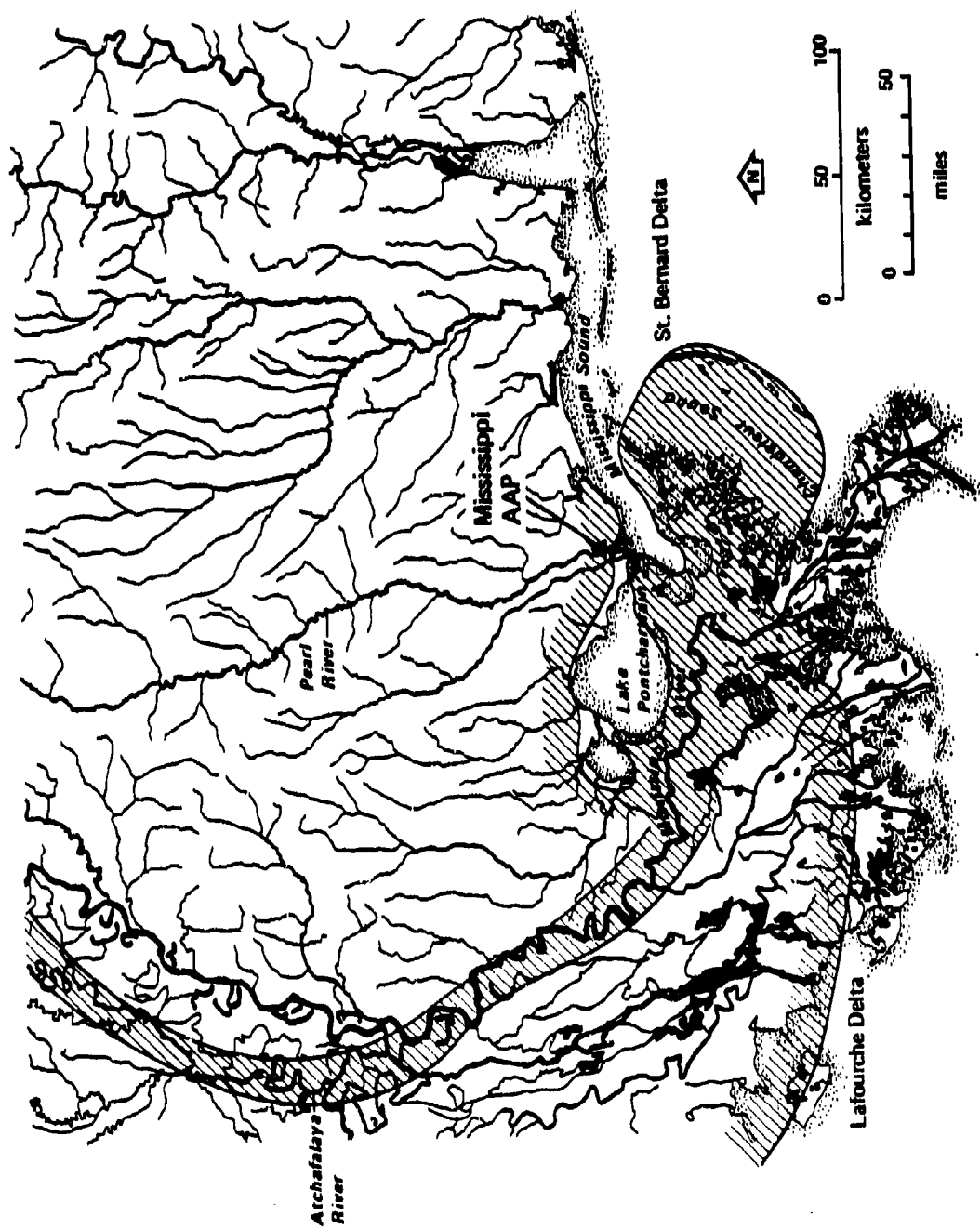


Figure 2-4. APPROXIMATE LOCATION OF MAJOR GEOGRAPHIC FEATURES DURING THE POVERTY POINT AND TCHEFUNCTE PERIODS, ABOUT 2000 BC-AD 1 (data from Gagliano et al. 1982; Saucier 1963 and 1974)

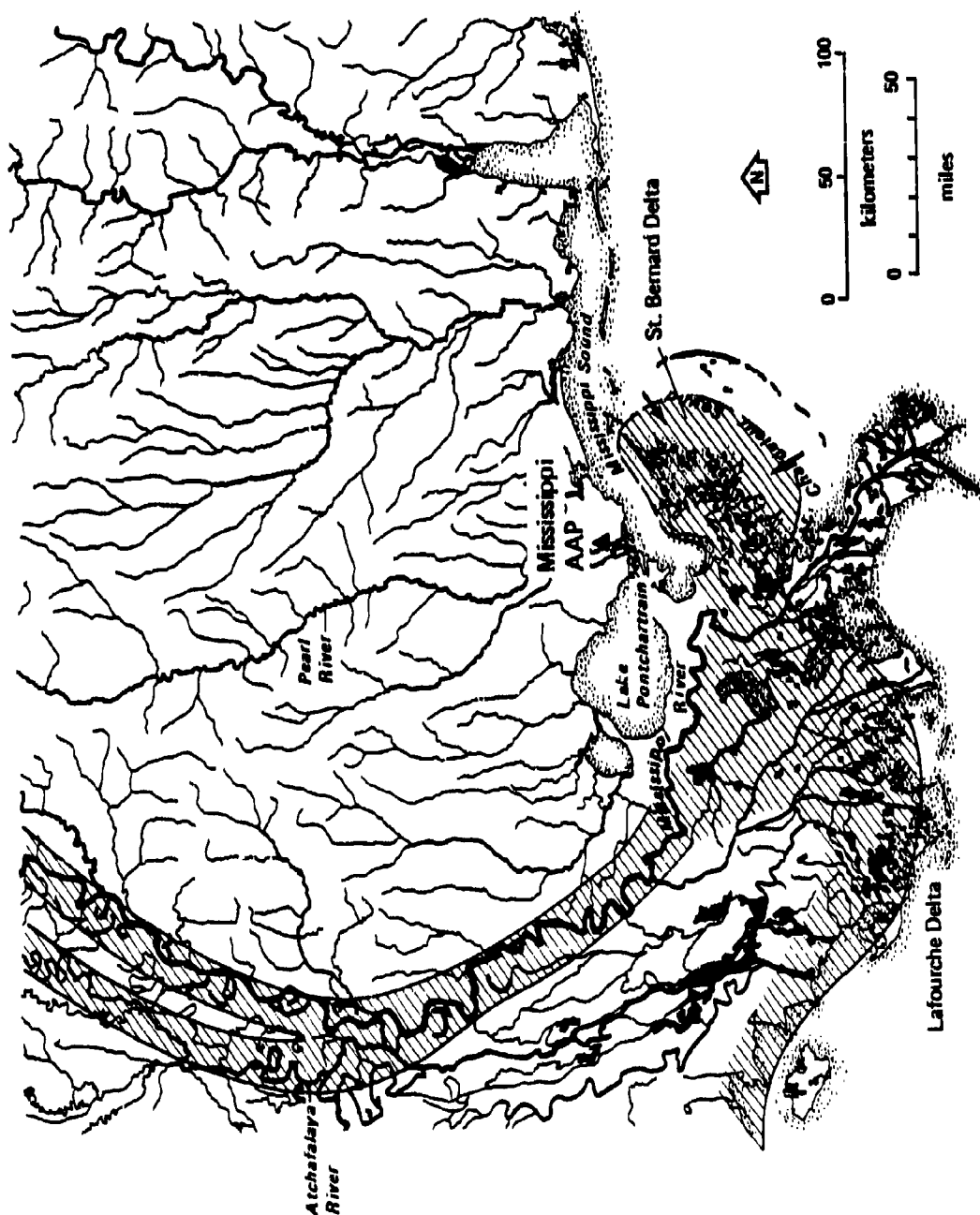


Figure 2-5. APPROXIMATE LOCATION OF MAJOR GEOGRAPHIC FEATURES DURING THE MIDDLE AND LATE WOOD- LAND PERIODS, ABOUT AD 1-800 (data from Gagliano et al. 1982; Saucier 1963 and 1974)

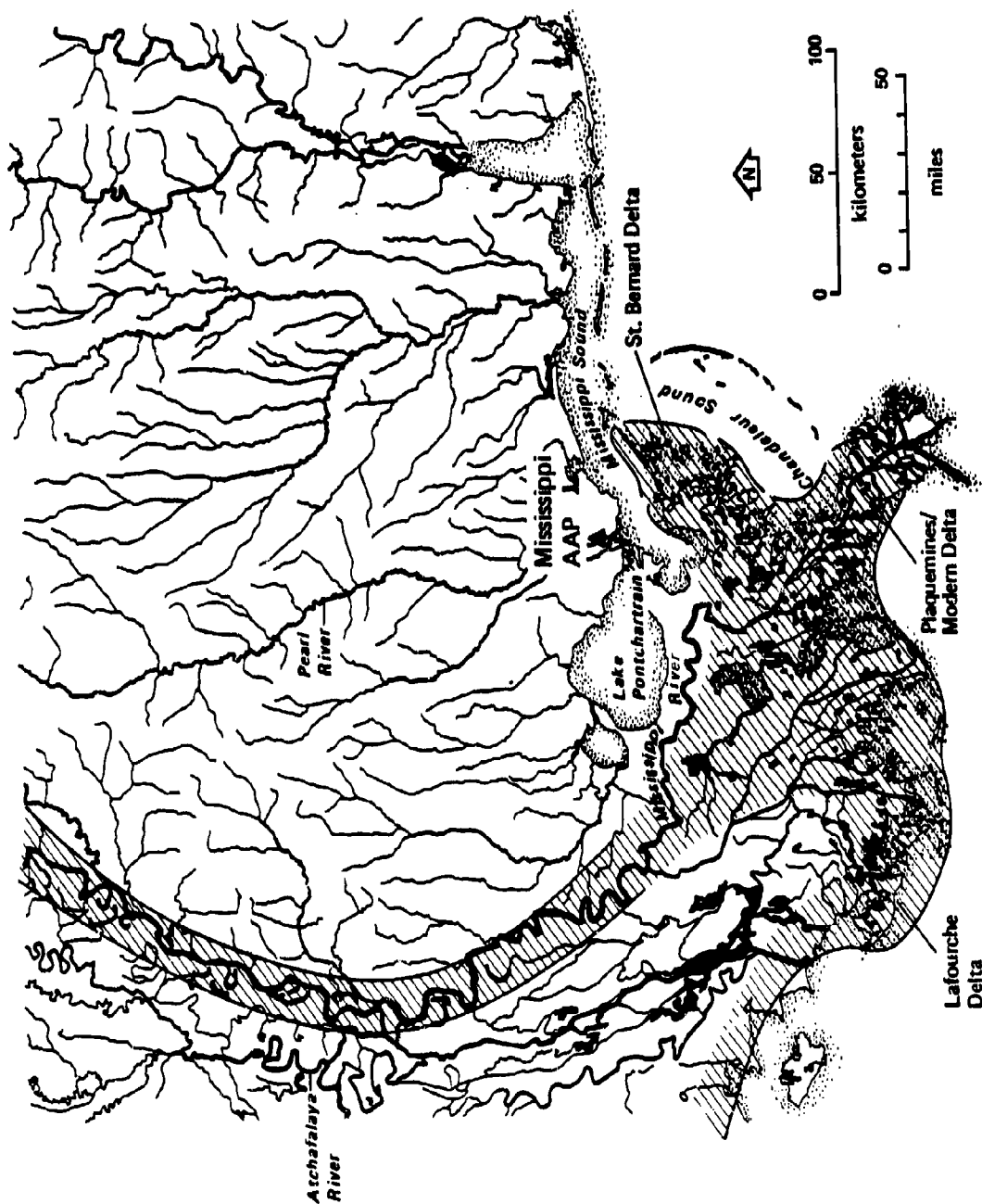


Figure 2-6. APPROXIMATE LOCATION OF MAJOR GEOGRAPHIC FEATURES DURING THE COLES CREEK AND MISSISSIPPIAN PERIODS, ABOUT AD 800-1550 (data from Gagliano et al. 1982; Saucier 1963 and 1974)

Table 2-2. A SUMMARY OF THE CULTURAL CHRONOLOGY OF THE AREA OF THE MISSISSIPPI AAF

Cultural Unit		Kinds of Archeological Remains Representative of Period		
Tradition	Period or Phase	Date	General Settlement Patterns	General Subsistence Systems
EuroAmerican	Industrial Development	Present to AD 1890	Family homesteads, scattered residential areas, towns, and small cities linked by railroads and highways	Fishing; logging; transportation; manufacturing, particularly lumber, ships, and paper; service industries
	Civil War and Reconstruction	AD 1890 to 1860	Family homesteads and towns linked by boat, dirt roads, and railroad	Fishing, trapping, hunting, transportation, logging, gardening
	Early Settlement	AD 1860 to 1780	Family homesteads and coastal settlements linked by boat and dirt roads	Fishing, trapping, hunting, transportation, gardening, gathering shellfish and wild plant foods
Historic and Protohistoric Indian	Frontier	AD 1780 to 1700	Family homesteads linked by boat and dirt roads	Fishing, trapping, hunting, transportation, gardening, gathering shellfish and wild plant foods
	Various	AD 1700 to 1550	Small villages and seasonal camps	Hunting, fishing, trapping, gardening, gathering shellfish and wild plant foods
	Late Mississippian	AD 1550 to 1200	Small villages and seasonal camps	Hunting, fishing, trapping, gardening, gathering shellfish and wild plant foods
Early Mississippian: Coles Creek	Various	AD 1200 to 800	Small villages and seasonal camps	Hunting, fishing, trapping, gardening, gathering shellfish and wild plant foods
	Various	AD 800 to 500	Small villages and seasonal camps	Hunting, fishing, trapping, gardening, gathering shellfish and wild plant foods

2-12

By about 8000 BC the Clovis point styles had been replaced locally by types such as Dalton and San Patrice. These were smaller in size and began the use of barbs and strong shoulders on points. They were perhaps used on spears thrown at relatively fast game such as deer, rather than thrust into relatively slow Pleistocene megafauna such as mastodon, which were virtually gone by this time. The increased importance of plant resources at this time is suggested in many areas of the Southeast by the presence of seed-grinding and woodworking tools.

The period from about 6000 BC to about 1500 BC is very poorly known locally. Test excavations in Jackson County, MS (Marshall 1982) revealed apparent Middle Archaic components containing Abby points. These are closely similar to Levy points of northern Florida and Stanley points of the Carolinas and Georgia, which both date to about 5000 to 4000 BC. Gagliano and Webb (1970:67) report a Morrow Mountain point from the Claiborne site, located on a relict barrier island at the present mouth of Pearl River. It should be noted also that this poorly known period spans a time of major climatic and geological changes in the area and terminates well after the establishment of essentially modern conditions there. The combined rise in sea level and influx of sedimentation may well have combined to submerge a major portion of the archeological record of the period under silt and water, particularly given the likely climatic stress that could have placed a premium on riverine and coastal resources (Figures 2-2, 2-3).

The Pearl River Phase of the Late Archaic cultural period was defined by Gagliano and Webb (1970) as the terminal Archaic occupation of the area. The key sites included are Cedarland and Graveyard, oyster shell middens flanking the present mouth of the Pearl River, and Cedar Point on the north shore of Lake Pontchartrain. Cedarland's lithic raw materials and copper indicate that its occupants were participants in a Late Archaic trade network that operated between the Appalachians and the Great Plains. A single radiocarbon determination of 3200 ± 130 years (1250 BC) (Gagliano and Webb 1970:69) from Cedarland probably does not relate to the Pearl River Phase occupation there, but may instead reflect later activity on the site.

Dates from good Poverty Point contexts throughout the Mississippi valley from south of New Orleans into northern Mississippi now indicate that the Poverty Point culture was well established in the area by at least 1700 BC and perhaps even earlier. Recent geological data presented by Saucier (1974), Gagliano (1979), and Gagliano et al. (1982) indicate that local salinity sufficient to support oysters was very unlikely after about 2500 to 2000 BC. At this time the final rapid sea level rise has been completed and major influx of both silt and fresh water had begun with the development of the St. Bernard Delta of the Mississippi River (Figures 2-4, 2-5). Saucier (1963:55-62) notes that a Cocodrie lobe distributary, aimed directly at the Pearl River estuary roughly along Interstate Highway 90, is to be considered the earliest of the St. Bernard Delta distributaries. The Claiborne site, the major Poverty Point period

site at the mouth of Pearl River, is less than 200 feet across a gully from Cedarland. It is composed of shells of brackish water-dwelling Rangia, and has a series of radiocarbon determinations that range from 2040 to 1150 BC (Webb 1977:5). The aggregate of these data suggests that the extant carbon date from Cedarland should be attributed to Poverty Point period activity on the site, probably by residents of Claiborne, and that the Pearl River Phase should date on the order of about 2500 BC.

The Poverty Point culture was the first in the region to construct large earthworks, and is widely known for its fired clay objects (apparently used as the heating element in earth-oven cooking), highly skilled lapidary work, long-range trade in status goods, and microlithic tool assemblage.

The subsequent Tchefuncte culture (Figure 2-6) finally accepted the routine use of pottery and is marked by localization of activities without the long-range trade and specialized arts and crafts of the Poverty Point culture. Local leaders were honored by burial in small mounds, a practice that continued throughout the eastern United States almost to the time of European settlement. The area was once again drawn into a large-scale trade network during the Middle Woodland period, with the Marksville culture as the regional representative. Earthworks and mounds again became important, this time on a dispersed, localized basis. The trade network collapsed with the end of Hopewellian culture of Ohio and upper Mississippi River valleys. However, the basic Marksville culture continued in the lower Mississippi valley as Troyville, and eastward along the Gulf Coast as the similar Weeden Island culture of northwestern Florida and adjacent portions of Georgia and Alabama.

Inland from the immediate coastal area the population was expanding rapidly and first gardening, then agriculture appear to have been involved. Chiefdoms arose with more permanent and effective organization. The Coles Creek culture developed the use of platform mounds for public buildings arranged around a central plaza as the local seat of political and religious authority. This basic system further developed into the Mississippian culture observed by the DeSoto expedition of AD 1539-1542, and survived in attenuated form as represented by the Natchez of the early eighteenth century. In the coastal area however, life continued with a few political/religious centers but without the intensive agriculture, large fortified towns, and high population densities found in the Mississippi River valley north of Natchez. Plant cultivation was done on a small scale, but hunting, fishing, and gathering of marine, estuarine, and fresh-water resources continued to be the mainstay of the economy.

2.2.2 Ethnohistory

The resident tribe of the lower Pearl River at the time of initial sustained European contact was the Acolapissa, a small tribe encountered by the French in 1699. They had a village about four leagues (about 12 miles) above the mouth of the river and were already combined with the

Tangipahoa (Swanton 1911:281). The initial contact was of short duration, since the French operations were concentrated on the lower Mississippi River from bases off present-day Ship Island and at Biloxi and then later above present-day Mobile. The Acolapissa moved to the north shore of Lake Pontchartrain about 1702, then to a new village above New Orleans about 1720, before vanishing from the historical record in the mid-1700s.

The salient few recorded bits of information about the Acolapissa were documented about 1706, during their residence on Lake Pontchartrain but before major acculturation. The village is described as having a round temple that contained a variety of figurines kept in closed containers and the bones of the dead. Bodies were reduced to skeletons by placement on a low scaffold, sealed in soil, for six months. The bones were then removed, cleaned, and carried to the temple in a basket. The temple thus served as the tribal mausoleum.

Different types of food, such as meat and fish, were cooked in separate pots. Bear fat was the basic cooking oil and dressing in use. Nuts were crushed and used as a porridge or mixed with cornmeal in breads. Deer were hunted by stalking while wearing a deerskin, dressed with the head and antlers attached, a disguise commonly used throughout the southeastern United States.

Houses in the village above New Orleans were round with a thatched roof of palmetto leaves covered with mats. The chief's house is said to have been 36 feet in diameter; presumably the rest were smaller. Within a few years after this village was established the Acolapissa had become fused with remnants of the Bayougoula, Houma, and Mugulasha, all Muskogean tribes of the Lake Pontchartrain vicinity who had become allies of the French. Quimby (1957) provided perhaps one idea of what a site of the contact period might reveal. However, his picture is confused by rapid multiple occupations of an earlier prehistoric site by tribes whose traditional architecture differed, but who were by that time in the process of fusion and mutual exchange of customs.

d'Iberville (1981:139-140) provided a description of a deserted Biloxi village he found about 6.5 leagues (about 20 miles) up the Pascagoula River in 1700. It is described as having 30 to 40 oblong huts with bark roofs and an eight-foot high palisade of 1.5-foot thick timbers. The palisade was further equipped with a form of plastered box that was ten feet square and was raised eight feet above the ground on posts; one was placed at each corner of the wall and at the center of each wall section, with loopholes from which to shoot arrows. This general form of fortification is widely known from late prehistoric contexts in the Mississippi valley and the southeastern United States where Mississippian cultural influence appears.

2.2.3 History

Until the middle of the eighteenth century the area saw little Euro-american activity other than travel across the mouth of Pearl River between New Orleans and the Biloxi-Mobile area. By the mid-1700s a few

plantations appeared on the Prairie terrace surface near the mouth of the river. Early traffic simply bypassed Pearl River, using small vessels to shuttle back and forth along the coast between New Orleans, Biloxi, and Mobile from anchorages at Dauphin Island off the mouth of Mobile Bay and at New Orleans. The favored route followed the coast to the Rigolets entrance to Lake Pontchartrain, then along the lake shore to Bayou St. John and into New Orleans via the bayou. The capital of Louisiana was moved from Biloxi to New Orleans in 1723 in keeping with French emphasis on settlements up the Mississippi River. Bay St. Louis and Pascagoula had been founded at least by 1727 when they were inspected by the newly arrived Governor Periere (Lowry and McCardle 1891:69).

Britain gained the former French possessions east of the Mississippi River, except New Orleans, by the Treaty of Paris in 1763. British rule introduced the use of small land grants to war veterans as a means of encouraging settlement. British West Florida was established as essentially the southern third of Mississippi and Alabama along with Florida west of the Appalachicola River and eastern Louisiana, with its capitol at Pensacola. British policy was particularly successful in increasing settlement in the Mississippi valley, but also brought new settlers to the coastal area.

Spain retook the area by a series of deft military moves in 1779-1781 and retained the area south of latitude 31° by the Treaty of Madrid in 1795. The Spanish continued the British policy of encouraging settlement by the award of small land grants to prospective settlers, and acquired an influx of settlers from the United States. This policy backfired in 1810 when the settlers proclaimed the Republic of West Florida, then promptly had themselves annexed by the United States. The area west of Pearl River was added to Louisiana, while the portion between Pearl River and the Perdido River was added to Mississippi Territory in 1812. Hancock County was formed in December of 1812 with Pearlinton as its intended major town.

By 1816, maps of the area (Gagliano 1979:3-27, 3-28) show roads eastward from both the mouth of Mulatto Bayou (an area with archeological evidence of a plantation by the late 1700s) and the approximate location of Pearlinton. A series of maps reprinted by the Mississippi Department of Archives and History (MDAH) in 1969 shows a road extending north along the Pearl River from Pearlinton by about 1842 (MDAH 1969:Map 3), with the town of Habolochitto (now Picayune) added by 1850. The area escaped significant attention during the Civil War, and except for the coastal towns it remained relatively isolated and unpopulated until outside economic developments brought sudden massive change to the landscape and economy.

During the 1870s the national railroad system was undergoing rapid development. During this period the present Illinois Central trunk line from New Orleans to Chicago was assembled by merger of a series of local roads, and the New Orleans and Mobile, now part of the Louisville and

Nashville system, opened the area to major freight movement. During this same period the last of the major northern pine forests was cleared and a new source of lumber was needed. The southern coastal plain pine belt, still mostly in virgin timber and now accessible by rail, became the next major source. By 1879 one of the largest lumber mills in the south was in operation at the mouth of the Pearl River (Hickman 1973:213). The 1873 "Map of Mississippi" from Gray's Atlas (MDAH 1969:Map 5) shows the Mobile and New Orleans railroad as completed and most of the new Illinois Central trunk line in place. The town of Gainesville, now part of the NASA Test Facility, appears on this map as do the towns of Pinetucky and Riceville, north of Picayune.

The logging industry built up rapidly, with railroads shipping large quantities of lumber north into the Midwestern states. Most of the land was bought up in huge tracts by the various lumber companies. Initial selective cutting of all the prime timber was essentially complete in the pine belt by about 1900 (Hickman 1973:210). By 1910 about half the land had been clearcut, and rapid mechanization begun about this time helped finish the rest by 1930. Some efforts were made during the 1920s to develop the cutover land for agriculture, but the soil was too poor for crops. The few attempts at reforestation failed due to lack of fire control until the Civilian Conservation Corps, Federal timber management, and fire control programs of the 1930s took effect over a large enough area. Most of the area is now reforested and used primarily for pulpwood rather than lumber production.

2.3 ARCHEOLOGICAL RESEARCH DIRECTIONS

2.3.1 Regional Concerns

The primary regional concerns are expansion of the very weak data base for the region east of New Orleans, and unravelling of the complex interaction of shifting geological features and habitats. Archeological survey of the area around the margin of Lake Pontchartrain has been in progress since the 1920s, although development of canals, industrial sites, highways, and suburbs has far outstripped survey and excavation capabilities in the area for at least 30 years. Survey work along the Pearl River has been virtually nonexistent outside the vicinity of Mulatto Bayou. Major prehistoric concerns include the definition of the nature and extent of occupation during all periods, and the relationships of inland and coastal occupations to each other and to those west on the Mississippi River delta complexes. Gagliano et al. (1982) have begun work on the location of submerged sites, both offshore and under coastal marshes. Keller (1982:40-51) has begun work on small sites in the pine forest area as another aspect of the regional settlement-subsistence system.

2.3.2 Installation-Specific Archeological Research Directions

Since there presently is no inventory of the archeological resources of the Mississippi AAP, the acquisition of such an inventory record is preliminary to the definition of possible research directions there. If

sites are located along the Pearl River bluff line, their relationship to sites at the head of the Pearl River estuary would be an important pre-historic issue. In addition, it is possible that the reported AD 1700 Acolapissa village is on the property. AAP resources could also support research into the age, nature, and extent of historic period occupations, particularly along the Pearl River bankline and the early road inland along Pearl River from near its mouth.

AN ASSESSMENT OF ARCHEOLOGICAL RESOURCE
PRESERVATION AND SURVEY ADEQUACY

3.1 ENVIRONMENTAL CONSTRAINTS TO SITE PRESERVATION

Local environmental constraints to site preservation include erosion from terrace surfaces and margins, lateral migration of large streams such as the Pearl River, and wave action associated with normal beach development and with hurricanes. Where soil erosion has been a dominant factor, heavy items may be dropped vertically several feet below their original context while soil and lighter objects may have been washed away. However, soil deposition may seal relatively intact sites under a layer of silt; the Mississippi River delta abounds in examples of such sites. Secondary factors affecting site preservation include soil chemistry, moisture, permeability, degree of moisture saturation, and soil grain size. Submersion of a site below the water table often has the effect of preserving perishable organic items, from nut hulls and basketry to dugout canoes, and permits a far more complete picture of life at that time and place than would normally be possible. Any porous items saturated with salt water and allowed to dry in that condition, as would occur on a beach, will be rapidly destroyed by crystallization of salt within the pores of the object.

The Mississippi AAP includes a portion of the Pearl River floodplain, where both buried sites and sites with preserved organic remains must be considered reasonably possible occurrences. All the facility soils are quite acid, a factor which can be expected to have destroyed any bone present at the sites except in very special circumstances, such as when they have been included in a massive shell midden or charred.

3.2 HISTORIC AND RECENT LAND USE PATTERNS

Except in the immediate vicinity of the road along the east bank of Pearl River, the Mississippi AAP lands seem to have been in forest during most of recorded history. Fishing, trapping, hunting, a bit of gardening, and the coastal trade appear to have been the primary traditional economic activities of the area, and these involved little land clearing or soil disturbance. However, the logging boom of 1880-1930 may have had devastating effects on any remnant shallow upland archeological sites and on any sites within two or three feet of the surface of the floodplain

swamps. Damage in the swamps would have resulted from rutting and miring of the large wagons used to haul logs out during the relatively dry seasons. Historic photographs (Hickman 1973) indicate the use of wagons built much like modern log-hauling trailers, with iron-banded wheels five or six feet in diameter and only about four to six inches wide. Such wagons could be expected to mire down about three feet before bottoming against more solid material. This damage would have been concentrated on the haul roads, which would have shifted at random as convenience and quagmires dictated. Occasional replacement of wagon haul roads by temporary logging railroads may have lessened the impact of later operations, except where grades were improved.

Some erosion can be expected to have occurred after completion of virtual clearcutting and after the perennial fires of the immediate post-logging period. More crucial, however, is reforestation. The earliest planting was done by crews with spades who dug a relatively shallow individual hole for each tree and probably did only negligible damage to any archeological sites encountered. A more recent and much more widely followed method is to use a heavy plow mounted on a bulldozer or large tractor to rip open furrows up to two feet deep into which the seedlings are set. This method is particularly devastating over the long term as row locations or directions are shifted between harvests. Finally, the most recent technique in general use is to broadcast seed into a cleared area, usually from an airplane, then later to thin the resulting stand to the desired tree intervals with saws or chemical poisons. This method appears to be least physically destructive but the effects of the chemicals on the archeological resources remains unknown.

Modern harvesting techniques offer little improvement over those of the boom era. Track-mounted bulldozers, loaders, and Franklin loggers do not usually sink as deeply as did the old ox wagons. However, the wheel-mounted equipment also in common use does sink and generally has sufficient power to simply plow along through the mud. Use of high spots for maintenance and parking areas can add large amounts of fuel and oil to the soil of any site unfortunate enough to lie underneath. In swampy areas, high spots usually have sites on them.

All of these factors are likely to have affected the archeological resource base of Mississippi AAP, whose land was purchased from timber interests. The extent of such damage can only be assessed by review of the methods used by the companies involved over the years and by examination of the particular sites when found. Military construction appears to have resulted in localized impact in the immediate vicinity of the building complexes (Table 3-1, Figure 3-1), and is estimated to have affected only 532 acres of the AAP's 7148 acre area. Some 6600 acres are thus relatively unmodified except by forestry activities.

3.3 SUMMARY ASSESSMENT OF DATA ADEQUACY, GAPS

Prior to the completion of this overview and management plan, personnel at the Mississippi AAP informed the National Park Service that

Table 3-1. A SUMMARY OF HISTORIC AND MODERN GROUND DISTURBANCE THAT MIGHT LIMIT THE PRESENT ARCHEOLOGICAL RESOURCE BASE ON THE MISSISSIPPI AAP

GDA No. ^a	Type of Disturbance	Date Con- ducted (yr)	Reference	Area Dis- turbed (acres)	Esti- mated Depth Below Surface (ft)	Ratio of Dis- turbed to Total Area	Location of Disturbed Area						USGS Quad Map ^c	Colinci- dental Sites
							UTM ^b		Legal Reference					
							Northing	Easting	Town- ship	Range	Section			
1	Construction of headquarters and main assembly complex	1982	Facility Plan	190	10	8:10	33 64 340 33 64 700 33 64 720 33 65 190 33 65 170 33 64 400	2 47 830 2 47 830 2 48 480 2 48 480 2 49 290 2 49 265	7S	16W	32,37	D757R	None	
2	Construction of production line	1982	Facility Plan	32	10	9:10	33 63 825 33 64 120 33 64 120 33 63 840 33 63 700 33 63 530 33 63 530	2 49 240 2 49 240 2 49 600 2 49 940 2 49 940 2 49 770 2 49 550	8S	16W	4	D757R	None	
3	Test Area	1982	Facility Plan	80	4	9:10	33 63 740 33 64 220 33 64 190 33 63 720	2 50 250 2 50 260 2 50 860 2 50 840	7S 8S	16W 16W	33,34 4,3	D757R	None	
4	Igloo storage area	1982	Facility Plan	45	4	9:10	33 65 875 33 66 070 33 66 070 33 65 865	2 50 290 2 50 290 2 51 190 2 51 190	7S	16W	28,27	D757R	None	
5	Railroad loading area	1982	Facility Plan	55	4	7:10	33 66 170 33 66 935 33 66 990 33 66 890	2 49 290 2 49 070 2 49 500 2 49 580	7S	16W	28	D757R	None	
6	Railroad loading area	1982	Facility Plan	80	4	7:10	33 67 120 33 67 410 33 67 395 33 67 000	2 47 575 2 47 790 2 48 290 2 48 865	7S	16W	29	D757R W755R ^c	None	

^a Ground Disturbance Areas (GDAs) as mapped in Figure 3-1.^b UTM = Universal Transverse Mercator coordinates, Zone 16. If the area is less than 10 acres in extent, the coordinates record the approximate center of the site. If it is larger, they record the corners of a 3-or-more sided figure than encloses the site. Coordinates have been calculated specifically for this study.^c D757 = Dead Tiger Creek, NS 7.5 min. sheet (1957, photorevised 1970); W755R = Nicholson, LA-NS 7.5 min. sheet (1955, photorevised 1970).

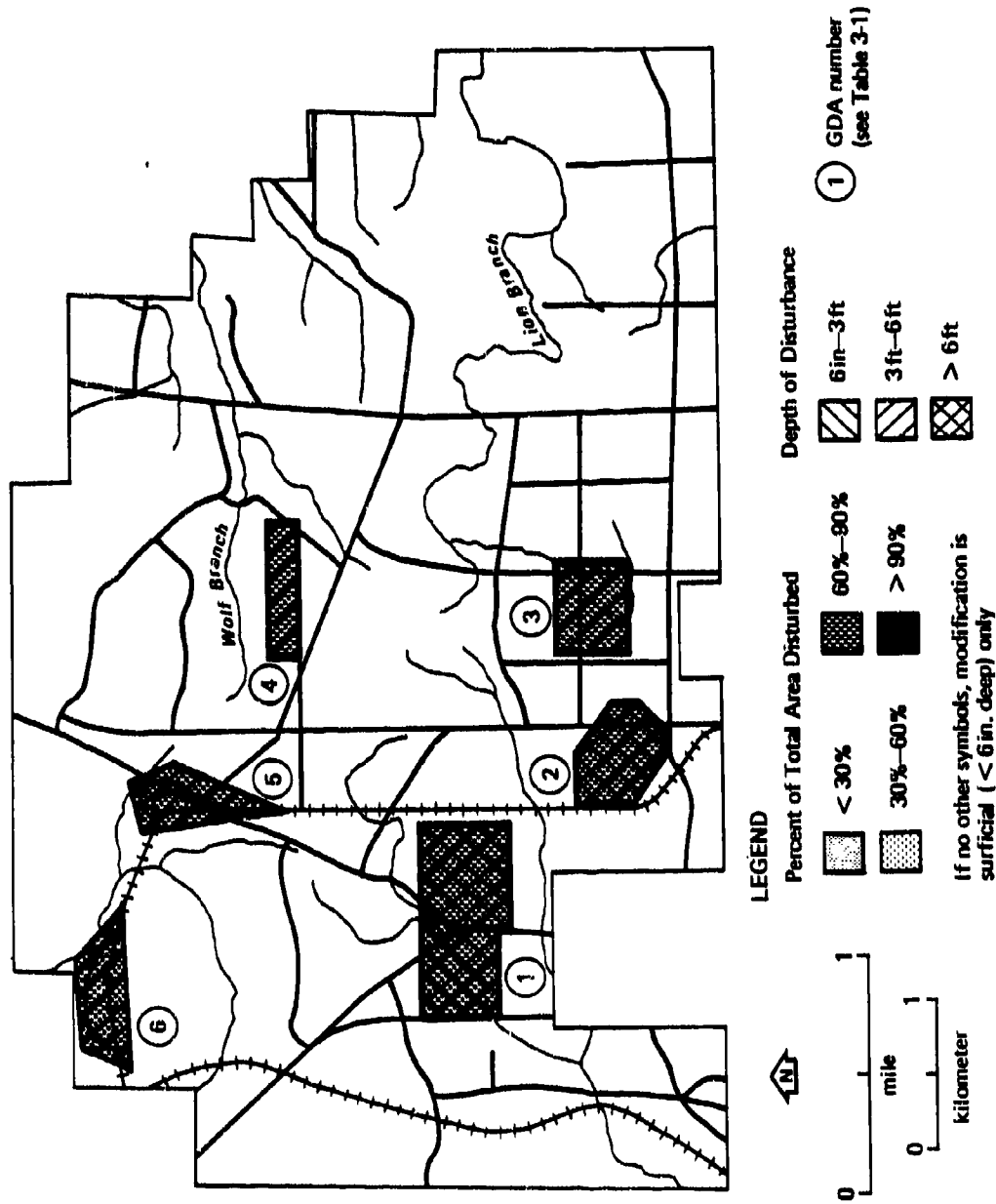


Figure 3-1. GROUND DISTURBANCE THAT MIGHT LIMIT THE PRESENT ARCHEOLOGICAL RESOURCE BASE ON THE MISSISSIPPI AAP

a cultural resources reconnaissance survey of AAP lands had been conducted in 1974 by a Louisiana State University archeologist (Mark Barnes, personal communication 1984). This was described as "minimal" survey, as the surveyors apparently only looked in the "most likely spots" of apparently unspecified portions of the then pre-facility property area. No archeological sites or isolated finds were recorded; only recent historic trash was found on what is now facility property. Mississippi AAP personnel have not retained records from that period, and have no copy of any report that may have been written; the Corps of Engineers office that supported the survey has no copy of the report (Harold Balbach, personal communication 1984). None of the senior archeologists at Louisiana State University (William Haag, personal communication 1984; Robert Neuman, personal communication 1984) or the University of New Orleans (Richard Beavers, personal communication 1984) participated in such a survey or has any information about it. Further, there are no surviving records of any field reconnaissance in the Mississippi Department of Archives and History Archaeological Survey files. Thus no data are available to meet present or future management needs.

4.0

KNOWN ARCHEOLOGICAL RESOURCES ON THE MISSISSIPPI AAP

No prehistoric or historic cultural resources are presently identified on the Mississippi AAP, although significant archeological sites exist in the vicinity (see Section 5.1). The facility is located on a terrace above the Pearl River floodplain, and the possibility exists that terrace deposits may retain buried prehistoric materials. Further, a historic townsite has been recorded two miles south of the facility on NASA property, and historic data suggest that an important contact-period Indian village exists within the immediate vicinity.

5.0

AN ASSESSMENT OF THE SIGNIFICANCE OF THE ARCHEOLOGICAL
RESOURCE BASE ON THE MISSISSIPPI AAP

5.1 THE SIGNIFICANT RESOURCE BASE

Sufficient archeological and historic data exist for the plant vicinity to indicate that prehistoric and/or historic archeological remains could occur on the property (Table 5-1). At least 20 sites have been recorded so far within a ten-mile radius of the facility, including one at the facility boundary and a historic townsite on the adjacent NASA property. Historic data suggest that an important contact-period Indian village is within the immediate vicinity. Recorded prehistoric sites in the vicinity include occupations representing the entire span of human occupation of the area.

5.1.1 Prehistoric Cultural Remains

Cultural remains from all prehistoric periods are represented from sites within a few miles of the facility and are expected to be present on the Mississippi AAP also. Sites to be expected from the Paleo-Indian through Middle Archaic periods would consist mainly of hunting and gathering camps along the crest of the terrace overlooking the Pearl River floodplain, and deeply buried under the modern surface. Late Archaic through Early Woodland period sites are likely to represent camps and hamlets of various types, oriented toward the use of changing resources of a saline embayment undergoing geologically rapid siltation and ultimate conversion to a fresh-water swamp. Middle Woodland through Protohistoric occupations are likely to consist of camps, hamlets, and villages of part-time agriculturalists also making extensive use of the wild resources of an essentially modern environment. The long-term archeological record should cover the cultural responses of the local inhabitants to a long series of drastic environmental changes. Sites of the Late Archaic through Early Woodland and the Protohistoric periods are those most likely to occur with sufficient integrity to provide significant cultural data. Unless deeply buried, earlier sites can be located under the Pearl River floodplain; sites of the remaining periods are most likely to consist of deflated short-term camps.

5.1.2 Historic Cultural Remains

The historic record indicates little or no Euroamerican occupation in the vicinity until the mid-1700s. By this time a few plantations, not

Table 5-1. SUMMARY OF SIGNIFICANT ARCHEOLOGICAL RESOURCES ON THE MISSISSIPPI AAP

Temporal Unit	Thematic Unit	Resource Type	Type Occurrence ^a			Sociocultural Association	Landform Association	Physical Integrity	Research Value ^b	RV CRC	Socio-cultural Value ^c	SCV CRC
			Known Occurrences (no.)	Potential Occurrences (no.)	Other Likely Occurrences (no.)							
Paleo-Indian	Hunting and gathering	Camp	0	0	+	Native American	Tertiary terrace edge	Poor	2	1	1	2
	Hunting and gathering	Camp	0	0	+	Native American	Tertiary terrace edge	Poor	2	1	1	2
	Hunting and gathering	Camp	0	0	+	Native American	Tertiary terrace edge	Poor	2	1	1	2
Late Archaic	Hunting and gathering	Upland camp	0	0	++	Native American	Tertiary terrace edge	Poor	2	1	1	2
	Hunting and gathering	Floodplain camp	0	0	+	Native American	Subsurface natural levee or beach	Excellent	5	2	2	2
	Hunting, gathering, incipient plant domestication	Upland camp	0	0	++	Native American	Tertiary terrace	Poor	2	1	1	2
Poverty Point	Hunting, gathering, incipient plant domestication	Floodplain camp	0	0	+	Native American	Natural levee	Good	5	2	2	2
	Hunting, gathering, incipient plant domestication	Upland camp or hamlet	0	0	++	Native American	Tertiary terrace	Fair	2	1	1	2
Early Woodland	Hunting, gathering, incipient plant domestication	Floodplain camp or hamlet	0	0	+	Native American	Natural levee	Good	5	2	2	2

Table 5-1. SUMMARY OF SIGNIFICANT ARCHEOLOGICAL RESOURCES ON THE MISSISSIPPI AAP (continued)

Temporal Unit	Thematic Unit	Resource Type	Type Occurrence ^a				Landform Association	Physical Integrity	Research Value ^b	RV CRC	Socio-cultural Value ^c
			Known Occurrences (no.)	Potential Occurrences (no.)	Other Likely Occurrences (no.)						
Middle Woodland	Hunting, gathering, incipient plant domestication	Upland camp or hamlet	0	0	++	Native American	Tertiary terrace	Fair	2	2	1
			0	0	+	Native American	Natural levee	Good	5	2	2
Late Woodland	Hunting, gathering, agriculture	Upland camp or hamlet	0	0	++	Native American	Tertiary terrace	Fair	2	2	1
			0	0	+	Native American	Natural levee	Good	5	2	2
Early Mississippian	Hunting, gathering, agriculture	Upland camp or hamlet	0	0	++	Native American	Tertiary terrace	Fair	2	2	1
			0	0	+	Native American	Natural levee	Good	5	2	2
Late Mississippian	Hunting, gathering, agriculture	Upland camp or hamlet	0	0	++	Native American	Tertiary terrace	Fair	2	2	2
			0	0	+	Native American	Natural levee	Good	5	2	1
Protohistoric Indian	Hunting, gathering, acculturation	Village	0	0	+	Native American	Tertiary terrace	Fair	5	2	3
			0	0	++	Native American	Natural levee	Good	5	2	2

Table 5-1. SUMMARY OF SIGNIFICANT ARCHEOLOGICAL RESOURCES ON THE MISSISSIPPI AAP (concluded)

Temporal Unit	Thematic Unit	Resource Type	Type Occurrence ^a				Sociocultural Association	Landform Association	Physical Integrity	Research Value ^b	RV CR ^c	Socio-cultural Value ^d	SCV CR ^c
			Known Occurrences (no.)	Potential Occurrences (no.)	Other Likely Occurrences								
Frontier	Initial settlement	Homesteads and camps	0	0	+		Euro-American	Tertiary terrace	Fair	3	2	3	2
Early Settlement	Established settlement	Homesteads and camps	0	0	+		Euro-American	Tertiary terrace	Fair	3	2	2	2
Civil War and Reconstruction	Socioeconomic	Homesteads and camps	0	0	+		Euro-American	Tertiary terrace	Fair	3	2	1	2
Industrial Development	Effects of logging boom	Homesteads, camp, logging facilities	0	0	+		Euro-American	Tertiary terrace	Fair	3	2	1	2

^a The number of presently known or potential archeological resources of this type is specified here. In addition a judgement has been made as to the likelihood that other members of this resource occur within the facility, based on an analysis of the ethnohistoric or historic land use patterns and/or a review of the landform patterning of prehistoric materials. The probability of these additional occurrences has been noted as negative (-), positive (+), or highly positive (++).

^b This is a subjective summary assessment of the overall research value (RV) of the resource class. It is an evaluation of the class' quality of preservation, representation of activity diversity or uniqueness, and temporal distinctiveness or reflection of dischronic relationships. It incorporates the need to avoid triviality, but to acquire what may be redundant data so as to discern patterns among those data. Based on these research values, the resource classes under discussion are ranked from 0 (no value) to 5 (highest value), including "NA" if such an evaluation is believed to be impossible given the available information.

^c The Confidence Rating (CR) is a further evaluation of the perceived reliability of the research (RV) or sociocultural (SCV) values of the resource class. 1 = the judgement is more guess than science, and likely not to be reliable; 2 = the judgement is moderately reliable; 3 = the judgement is most likely reliable.

^d This is a subjective summary assessment of the overall sociocultural value (SCV) of the resource class. It is an evaluation of the social, religious, or political importance of the resource to a contemporary community, from 0 (no value) to 5 (highest value).

necessarily the classic pretentious establishments of the following century, and probably various squatters' cabins, were present in the area. Construction of a road along the terrace near the floodplain by the early 1840s may have had some effect on settlement in its vicinity. The establishment of Gainesville a few miles south of the facility boundary by the 1870s may have resulted in increased activity along the road in the form of early logging camps, supply yards, and fishermen's houses.

The degree of disturbance associated with activities during the logging boom era is uncertain, but the heavily used dirt/mud roads of the era should probably be regarded as zones of intertwined ruts and mudholes rather than the neatly confined hard-surfaced roads of today. Cisterns, foundations, and trash dumps are the most likely historic period remains to be encountered.

5.2 IDEAL GOALS AND OBJECTIVES

Given the assumption that significant (and presently unidentified) archeological resources appear to be located on the property, the following is an outline of a desirable program to manage these resources for the best preservation or use of their research and sociocultural values. An ideal facility archeological resource management program would encompass identification, evaluation, conservation, excavation and analysis, and interpretation activities. It would emphasize the conservation of significant resources, and their excavation or "use" only to mitigate any unavoidable destruction or damaging activities or in search of important information that is being collected and studied within a well designed research project.

Since only a minimal reconnaissance and testing of the "most likely spots" has occurred on the Mississippi AAP, the first step in developing a management program is field identification of the sites predicted to be there. Such an identification program should begin with a more intensive and extensive review of oral and archival historic information. The focus of this preliminary review would be to evaluate the historical information base presently available without recourse to any historical archeological investigations and, through consultation with professional historians and people with personal ties to the pre-facility area occupants, evaluate the historic significance of any materials that might be left on the facility. This would complement the more extensive evaluations of natural resource distributions presented within this report as the basis of evaluating the distribution and potential significance of any prehistoric archeological resources there.

The next stage of the identification program would be the field inventory of the undisturbed portions of the facility to identify the surface evidence of any historic or prehistoric archeological sites. Such an identification project would include the pedestrian survey of the facility, with close-interval spacing of survey transects. Large-scale aerial photographs and detailed topographic maps should be used for field reference. Standard forms for recording the surface characteristics of

identified prehistoric and historic resources should be completed as part of the inventory procedures and the area and methods of the survey should be well documented. The preferred survey policy for most contemporary projects is to make only minimal collections of artifacts off of site surfaces, retaining a representative sample including artifacts that are diagnostic of particular styles and/or technologies or are immediately vulnerable to non-professional collection or damage. Any collected materials should be fully described and appropriately curated.

In addition to a description of the surface evidence of these sites, the ideal inventory would include some kinds of subsurface investigation (e.g., augering, test excavation, remote sensing) to evaluate the contents, extent, and integrity of the identified resources. Finally, this stage should include an identification of the important research or other values inherent in the inventoried sites, both as a basis for the development of future research designs as well as for the evaluation of management options should the resource be threatened with damage or destruction by non-archeological research activities. For purposes of future research development, the identification and evaluation of the resources needs to be well documented and available to the research community. For future resource management purposes, it needs to be appropriately stated within the U. S. Department of the Interior's terminology and concepts of resource significance.

The prevailing professional approach to archeological resources for the past decade has been one of conservation (Lipe 1977:21)--"Our goal...is to see that archaeological resources everywhere are identified, protected, and managed for maximum longevity." Thus, the ideal objective is to develop a "bank" of significant sites that may be investigated through a variety of techniques, including destructive excavation, only as part of well designed research projects that are scheduled within a regional research program that seeks to maintain the overall range of undisturbed sites for future use. A corollary to this is that the sites should be allowed to be investigated by scientists in a non-reactive situation (i.e., not threatened with immediate destruction of the resource). Such basic investigation of resources on the public lands should be conducted only within research designs that are appropriate to the contemporary regional or broader study questions. It should also be conducted only within a program that includes long-term protection of the information collected from the resources, and a commitment to the public dissemination of that information.

If an archeological site evaluated as being of research or sociocultural significance is going to be damaged or destroyed, the ideal objective would be to preserve its included materials and information values through a "salvage" or "data recovery" program. Such a program would be little different from the non-reactive investigations discussed above, but is likely to be conducted in emergency situations with requirements for immediate recovery. Again, an important element in such an emergency research program would be the adequate analysis, curation, and publication of the recovered information.

Thus, in summary the ideal goals for the management of the Mississippi AAP archeological resources are to:

- Inventory and evaluate all the resources on the facility
- Conserve the significant sites, allowing their research use only within a regional research design
- Recover the contents and information from any significant resources threatened by damage or destruction
- Provide the public with the substance of the information values that are inherent within or collected from the facility's archeological resource base.

**A RECOMMENDED ARCHEOLOGICAL MANAGEMENT PLAN
FOR THE MISSISSIPPI ARMY AMMUNITION PLANT**

6.1 FACILITY MASTER PLAN

The facility master plan, establishing phased development of the facility, has essentially been completed. Plant personnel expressed no expectation of significant modifications of the facility in the foreseeable future.

6.2 APPROPRIATE ARCHEOLOGICAL MANAGEMENT GOALS**6.2.1 General Facility Planning**

The most fundamental goal for archeological resource management at the Mississippi AAP is the integration of such management into a facility Historic Preservation Plan developed under the guidance of AR 420. A major element to the development of this Plan is the characterization of the archeological resource base, as theoretically outlined in Table 5-1, based on well-controlled field data. Completion of such field inventory evaluations, combined with archival research and an evaluation of any historic architectural resource base on the AAP, would also assist in bringing the facility into compliance with the general goals of Section 110 of the National Historic Preservation Act. It would also facilitate timely consultation with the Mississippi State Historic Preservation Office and with the Advisory Council on Historic Preservation as part of any project-specific Section 106 reviews needed for new projects or lease renewals.

The following discussion of recommended management directions and priorities is thus focused on the acquisition of baseline archeological resource inventory and evaluation data, and of resource-specific management recommendations made in the context of an adequate characterization of the overall prehistoric and historic archeological resource base on the AAP. The development of a multi-disciplinary facility Historic Preservation Plan, which could appropriately be done as a contract involving archeologists as well as historic architects/engineers and historians, is not presented in detail in this report other than as a necessary next stage beyond the following recommendations.

6.2.2 A Summary of Recommended Management Directions and Priorities

Full compliance with Section 110 involves completion of an inventory and evaluation of all "historic properties" (prehistoric and historic

archeological sites as well as historic architectural or engineering resources) on the Mississippi AAP. The completion of such an inventory on an "as needed" basis is appropriate to large government properties where there are not many new ground-disturbing activities. A primary definition of inventory "need" is relative to general facility planning needs--enough field-truthed information is needed about the facility's archeological resources in order to characterize or predict the overall resource base requiring management. Decisions about which site to "bank" for future research, which to excavate and study now in order to develop a better understanding of the resources and/or to answer important scientific questions, and which resources to allow to be destroyed should be made within the context of the overall facility resource base.

The definition of "how much is enough?" inventory information for planning needs requires a somewhat circuitous answer when first asked about a buried resource that presently is not even described from the surface information. The general approach used in prehistoric archeology today is to develop a stratified sample design that uses natural environmental zonation as the stratification criterion. This approach is basic to the outline of Section 2.0, which is a first description of the natural environmental information that is likely to be relevant to the distribution of prehistoric activities and hence their archeological remains. That information suggests that stratification of the less-disturbed portion of the Mississippi AAP by landforms (e.g., terrace, floodplain) would be an appropriate design strategy. Thus, a stratified selection of 16 inventory plots in 40 acre units (each being a single quarter-quarter-quarter section) distributed by landform across the relatively undisturbed 6600 acres of the AAP (see p. 3-2 above) would result in a 10 percent "black box" sample of the potential prehistoric resource base. Such a sample inventory program should be reviewed at various milestones (e.g., 10 percent completion, 35 percent completion, 75 percent completion) to evaluate the need to adjust sample units to take into account any sampling biases that are identified in the course of the survey program.

Thus, Phase I is recommended to be an archeological sample survey of the facility that is preceded by a review of the AAP documentary data and a more intensive geomorphological study aimed particularly at determining the depth and general nature of the alluvial fill in the portion of Pearl River floodplain in the western portion of the property. Since all the standing structures on the property were demolished after acquisition, their ages and nature as archeological sites will need to be determined from field studies and documentary sources. Some of these data are presently held in the Washington National Federal Records Center in Suitland, MD, in U. S. Army record groups RG 77 (Records of the Office of the Chief of Engineers) and RG 156 (Records of the Office of the Chief of Ordnance).

After the Phase I archeological site survey and historical records study has been completed, archeological sites that appear likely to be eligible for the National Register of Historic Places should be test excavated to determine their condition and scientific potential. This is

recommended even if they are not subject to impending damage or destruction, because of the need for developing an adequate characterization of this buried resource base. Once this work is accomplished, it will be possible to develop a realistic management plan for the archaeological remains confirmed to be of scientific significance and to reach agreement through the district Corps of Engineers Environmental Resources Section and the Mississippi State Historic Preservation Officer as to the specific management program that is appropriate to the identified resource base. The procedures and references to be provided in AR 420 should be of particular value in this regard. These goals are intended to comply in particular with Section 110(a)(2) of the National Historic Preservation Act, and the initial stages of development of a facility Historic Preservation Plan as required by AR 420 and 36 CFR 800.4(a).

6.3 ESTIMATED SCOPE OF WORK AND COST LEVELS FOR PRESENTLY IDENTIFIABLE MANAGEMENT NEEDS

6.3.1 Goals and Sources of Data

Since the requirements of the Phase II work will be almost entirely dependent of the findings of the Phase I investigations, no realistic scope of work can be provided beyond Phase I. Qualifications of all personnel should be at least those provided in AR 420, Appendix C.

Sources to be consulted for data other than primary archeological field work include:

- Thorough review of the archival information available at the facility and in the national archives
- Existing public and private collections with sufficient documentation to render them of scientific value as necessary for identification and use as comparative materials for analyzing facility collections
- Cartographic, historical, biological, and geological sources pertaining to the facility directly or including the area of the facility (as outlined in this overview)
- Wills, deeds, and property tax records related to land and historic period sites now in the facility
- Boring logs, site preparation plans, and as-built construction data on subsurface portions of facility structures
- Available surface and aerial photography of the facility and facility area.

The Phase I studies should permit, for all sites, determination of:

- Location and extent of the site

- Expectable kind and degree of disturbance
- Major components represented
- Major finds of activities represented such as village, hunting camp, farmstead, church and/or general store
- Relationship of the site to major resource zones and significant resources as appropriate to the components and activities represented
- Relationship of the site occupation to local and regional chronologies and settlement-subsistence patterns

Additional data to be obtained for historic period sites should include:

- The approximate location, size, and purpose of each structure on the site, particularly those recorded in the detailed preconstruction facility maps
- Expectable unrecorded outbuildings associated with recorded structures
- The nature of the activities carried out at the site as reflected by diagnostic artifacts
- The identity of the various owners/occupants of the site and correlation of the artifactual remains found on the site with the remains expectable from review of the documentary sources

6.3.2 Activities

The activities recommended above are grouped into categories in a manner suitable for different archeological/archival work groups functioning simultaneously or sequentially within the overall operation. It must be recognized that estimation of the specific amount of time and effort involved in such cultural resource investigations is not subject to a normal level of precision and control, since most of the relevant factors are unknown at the start of such a project. However, a primary function of this overview and management plan is to provide some better based estimates of future work and cost needs.

Archival Data Collection. The archival work should be aimed at both ethnohistoric data to be gleaned from the various early sources and more recent data on Colonial and post-Colonial settlement. Documents in both French and English can be expected to provide crucial data, and the researchers should be prepared to deal with both languages. Only such archival review should be involved in Phase I activities as is necessary to design the archeological survey and develop a facility Historic Preservation Plan. This is estimated to involve approximately 15 professional work-days.

Archeological Survey. This activity is to find, record, and collect samples of material from sites evident on the present land surface. Artifact collection is expected to be minimal, and include only temporally diagnostic items. Since virtually all the area of primary archeological site potential is in forest this will be reliable only if accompanied by shovel tests at 30-meter intervals. Survey with such testing (by shovel or core sampler) can be estimated as covering an average of 30 to 40 acres per person-day. Thus, survey with shovel testing of a 10 percent sample of the undisturbed 6600 acres of the Mississippi AAP, the sample design being stratified by landform, is estimated to require a minimum of 15 work-days in the field. In addition, 10 work-days would be required to design the survey sample.

If potential archeological sites are identified during the archival review outlined above, the survey should include all or part of those potential resource localities.

Anthropology Laboratory Work. Based on the assumption that there will be minimal artifact collection during survey, but that there will be extensive paper records, photographs, and maps requiring management, it is estimated that basic analysis and curation of collected materials recovered can be expected to average approximately two laboratory working hours per field hour, or approximately 26 person-days.

Integration of Archival, Environmental, and Archeological Data. This step will provide a preliminary working model of the local prehistoric and historic cultural developments remnant on the Mississippi AAP that merit preservation. It will be based on the archival and archeological investigation of a sample of the prehistoric and historic resource base, and is estimated to require 20 work-days to complete. If historic architectural survey information is available, this should also be integrated with the archival and archeological data, to provide an appropriate interdisciplinary basis for AAP preservation planning.

Recommendation for Further Action. The goal of Phase I activities as outlined here is the organization of appropriate information so that a facility Preservation Plan can be developed. Thus it is desirable that all identified resources be evaluated as to their eligibility for the National Register of Historic Places; their level of investigation should be appropriate to obtaining that goal. Thus, there will be a well-evaluated sample of inventoried resources from whose information a characterization of the significance of the overall facility resource base can be made. Each site must be evaluated against the definable scientific problems along with its degree of preservation and probable nature of its surviving data base, if any, and recommended either for no further action or for some degree of test excavation. The data obtainable under the conditions of this proposal are unlikely to provide detailed information about the extent or occupations of the sites located, but should indicate sites in excess of about 20 meters diameter that have surviving intact cultural deposits. To provide some basic guidance to planning the recommended Phase I activities, it is estimated here that test investigation

of five sites will be required during this sample investigation. Based on an assumption that an average site size will be 1000 square meters and site depth will be one meter, and that each site test requires an average 25 work-days in the field and 50 work-days in the laboratory, we estimate that this testing effort would involve 375 work-days.

Historic Preservation Plan Preparation. Organization of information collected during the activities outlined above into a facility Historic Preservation Plan will require a varying amount of effort depending on the outcome of the Phase I activities. Thus, it is not scoped or costed here. The completion of reports on each of the activities outlined above is assumed to be included within the scoping estimates.

6.3.3 Personnel Qualifications and Estimated Phase I Costs.

The qualifications of all personnel involved in the conduct of the activities outlined above should at least follow the guidance of AR 420. The nature of the work is such that it should be conducted in its entirety under the direction of an experienced cultural resource manager with a professional staff to include at least a prehistoric archeologist, a historic archeologist, and a historian. Consulting professional staff needs expectable include specialists in folklife, cartography, geology, botany, zoology, architectural history, and preservation planning. Technical staff requirements will include archeological field and laboratory assistants, photographer, cartographic draftspeople, assistant historian, and perhaps others to meet special contingencies. It may be most efficient and cost-effective to establish a field laboratory and base of operations on or adjacent to the facility for at least the duration of field operations.

The costs of the activities outlined in Section 6.3.2 are estimated as follows:

- Archival data collection. Assumptions of cost for this activity are that all necessary travel, reference, telecommunications, data management, search fees, and report preparation are included within a unit cost of \$25-\$30 per work hour. The estimate does not include a fee, general and administrative costs, or inflation multiplier. Thus, the estimated effort of 15 work-days to complete this activity, or 120 work-hours, is estimated to cost \$3000 to \$3600 in FY84 dollars.
- Archeological Survey. Assumptions for cost of this activity are that it includes no archival research but does include research design development, that the survey area is readily identifiable and accessible, that there are adequate aerial photos and maps available for recording locational data, that there will be minimal artifact collection, and that the survey rate is 50 acres/work-day. All necessary travel, reference, and telecommunications are assumed to be included within a unit rate of \$20-\$25/work-hour, but that rate is not loaded with fee, general and administrative, or inflation factors. Thus, the estimated

effort of 23 work-days to complete this field activity, or 184 work-hours, is estimated to cost \$3680 to \$4600 in FY84 dollars.

- Archeological Laboratory Work and Integration of Archival, Environmental, and Archeological Data. Assumptions for cost of this activity are similar to those presented above, with the additional assumption that the cost estimated under this heading does include report preparation costs. Thus, the suggested cost of these activities, which are expected to require 46 work-days or 368 work-hours at a rate of \$15-\$20/work-hour, is estimated to be between \$5520 and \$7360 in FY84 dollars.
- Test Excavations. If this additional activity is required, the investigation of an estimated five sites is suggested to involve 375 work-days or 3000 work-hours, which at a unit rate of \$20-\$25/work-hour would cost between \$60,000 and \$75,000 in FY84 dollars. Thus unit rate is based on assumptions as presented above, including the preparation of a final report.

Thus, if all of the activities outlined above were to be completed as part of Phase I of a historic preservation planning effort on the Mississippi AAP, the base costs are estimated to be between \$72,200 and \$85,560 in FY84 dollars.

7.0

SUMMARY

The Mississippi Army Ammunition Plant is a new facility of moderate size with a limited area devoted to manufacturing and storage facilities and a large buffer zone necessitated by adjacent other facilities. Virtually all land not in use for roads, buildings, and test areas is in timber. There are no structures remaining from previous land used and no documented archeological survey has been conducted on the facility.

Evaluation of the archeological needs of the facility was based on a tour of the facility, and review of extant archeological records and literature for the area. It was concluded that significant archeological sites are likely to exist on the facility. A comprehensive program of archeological, archival, and environmental studies is recommended in order to inventory a reliable sample of the resource base, as a baseline for planning further work and development of a facility Historic Preservation Plan. The anticipated base cost of the Phase I study is estimated at between \$72,200 and \$85,560 in FY84 dollars.

It is understood that the proposed program represents an ideal model for cultural resource management at the Mississippi AAP. Fiscal constraints may necessitate a different program. Facility personnel are encouraged to contact the Mississippi State Historic Preservation Officer in regard to new construction on the facility or development of survey programs.

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